Tampere University

Helmi Sukki

HUMAN CAPITAL PRODUCTIVITY MEASUREMENT

A case study

Faculty of Engineering and
Natural Sciences
Master's thesis
2019

ABSTRACT

Helmi Sukki: Human capital productivity measurement
Master's thesis
Tampere University
Information and Knowledge Management
07 2019

The purpose of this master's thesis was to study how to measure human capital productivity of salaried employees. The problem for this study was discovered by the target company to which the research was carried out. The research problem appeared by the target company's own internal interest to be able to manage their human capital more effectively. The wish was to solve which indicators provide the foundation for human capital productivity measurements and are able to measure it comprehensively. The goal was to provide a clear set of indicators for the target company to enable the start of the measurements.

This research was implemented by surveying different types of indicators for measuring human capital productivity. Based on the desire of the target company and on the utilized definition for the human capital productivity, it was decided that this study would focus on concerning monetary value indicators with some non-financial figures. In this research, in total 12 different indicators were presented. These indicators were surveyed, evaluated and classified based on their purposes of usage and characteristics. They were classified into four different categories that are productivity, profitability, qualitative features and supportive indicators. The purpose was to test how well this classification is actualized in the target company. The research utilized quantitative research methods and was implemented as a single case study. Data collection for this study was executed as a questionnaire to human resource and finance departments of the target company.

As a result, this study introduces four independent indicators for the human capital productivity measurements. These metrics are HCROI, HRCCR, HCRF and Absenteeism. Based on the classification presented in this research, these indicators measure human capital productivity extensively as they cover each category that is defined. However, it was also detected that human capital productivity is a complex phenomenon and there is not only one way to measure it. Also, it was discovered that the response rate for the questionnaire was rather low and selections are always based on employees own personal opinions. In the future, it would be interesting to implement the research in more companies to be able to provide more information about the similarities and differences with the results.

Keywords: Human capital, Intellectual capital, productivity, human capital productivity

TIIVISTELMÄ

Helmi Sukki: Henkilöstötuottavuuden mittaaminen
Diplomityö
Tampereen yliopisto
Tietojohtaminen
07 2019

Tämän tutkimuksen tarkoituksena oli selvittää, kuinka toimihenkilöstön tuottavuutta voidaan mitata organisaatiossa. Tutkimusongelma ilmeni tutkimuksen kohdeyrityksen omasta sisäisestä kiinnostuksesta hallita ja kehittää omaa henkilöstöpääomaansa aiempaa tehokkaammin. Tutkimuksen tavoitteena oli löytää ja tarjota kohdeyritykselle henkilöstötuottavuuteen soveltuvat konkreettinen mittaristo, joka soveltuu heidän tarpeisiinsa mitata henkilöstötuottavuutta mahdollisimman laajasti ja kattavasti.

Tutkimuksen toteutus aloitettiin kartoittamalla eri henkilöstötuottavuuden mittareita. Kohdeyrityksen toiveen ja työssä käytettävän henkilöstötuottavuuden määritelmän takia tutkimuksessa päätettiin keskittyä käsittelemään pääasiassa rahalliseen arvoon perustuvia mittareita, joita tuetaan ei-taloudellisilla mittareilla. Tutkimuksessa esiteltiin yhteensä 12 eri mittaria, joita tutkittiin, arvioitiin ja luokiteltiin niiden käyttötarkoitusten ja ominaisuuksien perusteella. Luokitteluiksi määritettiin tuottavuus, kannattavuus, laadulliset ominaisuudet ja tukea antavat mittarit. Tarkoituksena oli tutkia, millä tavoin määrittelyyn perustuva kattavuus toteutuu kohdeyrityksessä. Tutkimus toteutettiin kvantitatiivisena yksittäistapaustutkimuksena ja datan keruussa hyödynnettiin verkkokyselyä, joka kohdennettiin organisaation talous- ja henkilöstöhallinnon osastoille.

Tutkimuksen tuloksina saatiin neljä erillistä mittaria henkilöstötuottavuuden mittaamista varten. Nämä mittarit ovat HCROI, HRCCR, HCRF ja Poissaolot. Tässä tutkimuksessa esitetyn luokituksen perusteella mittaristo soveltuu mittamaan henkilöstötuottavuutta kattavasti, sillä ne vastaavat jokaisen luokittelun kategorian. Työn toteutuksen aikana kuitenkin huomattiin, että henkilöstötuottavuus on monimutkainen kokonaisuus, jonka mittaamiseen ei ole vain yhtä tapaa. Lisäksi havaittiin, että tutkimuksessa hyödynnetyn kyselyn vastausaste oli melko alhainen, ja että valitut mittarit perustuvat aina työntekijöiden omiin henkilökohtaisiin ajatuksiin ja mielipiteisiin. Tulevaisuudessa olisi mielenkiintoista toteuttaa tutkimus myös muihin saman toimialan yrityksiin, jotta voitaisiin tarkastella mahdollisia eroavaisuuksia ja samankaltaisuuksia tuloksissa.

Avainsanat: Aineeton pääoma, henkilöstöpääoma, tuottavuus, henkilöstötuottavuus

PREFACE

The years that I have spent in Tampere University of Technology have been the most meaningful time in my quite short life so far. Education, knowledge and experience that I have receive have prepared me well for the challenges in working life in the future. However, I consider the life-long lasting friendships the most valuable achievements I gained.

Writing this master's thesis has been an interesting, time-consuming and educational process. I would like to thank Professor Samuli Pekkola for guidance and instructions concerning the study. I would also like to thank all employees working in the target company for enabling this research and for active support and participation. The last but not least, I would like to thank my family and friends for remarkable support. Your existence was irreplaceable during the process.

Helsinki, 07/2019

Helmi Sukki

CONTENTS

1. INTRODUCTION

1.1 Background

Due to the changes in economic structure, the production model of companies has elaborated from utilizing physical resources to high-technology and intangible assets. In today's complex and dynamic business environment, the success of the enterprises and public organizations depends largely on their intellectual capital (Lönnqvist et al. 2005). The impact of intellectual capital has also increased signfificantly during the past years (Kujansivu et al. 2007, p. 38). Additionally, according to several studies (Stewart 1999, p. 5; Kannan & Aulbur 2004; Kesti & Syväjärvi 2015), companies have also understood intangible assets as resources to differ them from competitors and to gain competitive advantage.

Human capital is largely identified as the most important asset in an organization (Boudreau 1999; Fitz-ens 2000, p.1; Chang & Huang 2005; Betchel 2007; Kalkan et al. 2014; Kesti & Syväjärvi 2015). Human capital is considered as key factor in improving business performance (Crook et al. 2011; Kesti 2012; Kesti 2013; Kalkan 2014), gaining competitive advantage (Kesti 2012; Berzkalne & Zelgalve 2013; Kesti 2013; Liu et al. 2014; Weresa 2014, s. 53; Kesti & Syväjärvi 2015) and improving productivity (Stewart 1997, p. 85; Kujansivu et al. 2007, p. 40; Kalkan et al. 2014). Therefore, human capital should be identified as one of the most important concepts to be managed. Betchel (2007) notes that despite human capital is recognized as an important asset, it is often neglected in business strategy considerations due to the poor understanding of the concept.

Kujansivu et al. (2007, p. 161) state that managing and measuring intellectual capital is challenging due to non-physical nature of them. However, According to Kesti (2010, p. 15), success of a company lies strongly on the fact how well it can process its intellectual capital into measurable form. Quantifying the value of human capital into insightful information offers reliable evidence for the decision-makers (Fitz-enz 2000, p. 11). According to Betchel (2007), human capital cannot be a strategic factor until the monetary value of it is calculated. Additionally, Fitz-enz (2000, p. 8) states that without data on human capital and its productivity, it is not possible for a company to compete effectively.

This study is focusing on researching the measurement of human capital productivity of salaried employees. According to Kesti (2010, p. 15), human capital productivity refers to the return on investment made on employees. Bosh-Sijtsema et al. (2009) note that measuring productivity of knowledge-workers is challenging because the input and output are usually intangible. However, Uusi Rauva (1997, p. 17) states that understandable metrics should be developed and passed through the entire organization in order to develop productivity. Productivity improvement sets the base for creating wealth in companies (Lönnqvist 2007).

1.2 The basis for the research

The basis for the research has been set by the target company to which the research is carried out. The target company is a global enterprise operating in electronics industry. In Finland, the target company employs around 1000 people working in manufacturing, product development and administration. From all employees working in Vantaa, approximately 450 are indirect employees and 550 are direct employees.

The need for the research came out from the Human Resources department of the target company. The department identified an internal urge to be able to evaluate the status of its employees more effectively. They also desired to analyse more effectively the impacts of implemented decisions related to human capital. This need was further processed to interests to be able to understand human capital productivity better and to solve how is possible to measure productivity of undirect, salaried employees in the target organization.

1.3 Research problem and objectives

The starting point for defining research problem is set by the target company to which the research is implemented for. Research problem determined by the target company is to solve how to measure human capital productivity related to salaried employees in the organization. In this study, the research problem was also processed further to examine what set of indicators provides the base for measuring human capital productivity comprehensively. The research problem consists of a main research question and of two lower research question that amplify the main research question. The research problem is defined into a main research question which is presented below.

- How can human capital productivity be measured comprehensively?

Main research problem is answered with lower research questions that are presented below.

- What is human capital productivity?
- With what indicators human capital productivity can be measured and in what situation they can be used?

Main research question aims to answer the research problem of the study. The intention is to clear out what kind of indicators are available for measurement of human capital productivity, what kind of characteristics they have and in what kind of situations they can be used. Recognition of different attributes sets the basis for reviewing the comprehensiveness of indicators in order to measure human capital productivity. Thereafter, this prevalence is applied in the target organization. Lower research questions aim to define and specify the main research question. They do not bring any new perspectives to the research problem. The purpose of the lower research questions is to define the concepts of human capital productivity and metrics related to it and to estimate the relationship between them. This research also utilizes a questionnaire as a data collection technique and more specifically self-completed web questionnaire. The aim is to answer all the research questions by exploiting the survey.

In general, the objective of this research is to find a solution to the main research problem with the help of presented research questions. The purpose is to provide suitable set of indicators for the productivity measurements. For the target company, the goal for measuring human capital productivity is to provide more detailed information about the state of employees in the company. Measurements strives into set the basis for management in evaluating the impacts of human related decisions. The purpose is also to offer a comprehensive frame of reference for human capital productivity management for the company to be utilized in their actions.

1.4 Research scope

The study is outlined by the limitations to the research problem appointed by the target company. The research focuses only on the productivity measurement of salaried employees. The example calculations implemented for this thesis are also targeted considering only the salaried employees working in Finnish office. The data and information available in the company causes limitations to the realization of measurements. Also, in this study human capital productivity refers to the profit created by the contribution invested in the employees.

This research focuses mainly managing on indicators that can be used to describe the productivity of human capital in measurable and monetary form. Additionally, some of the non-financial figures that aim to represent the development of concepts of human

capital productivity. These limitations are based on the target company's own desire and to the need to be able to transform human capital measurements in to tangible form. Due to this and the limitations on resources in this master's thesis, this research considers only a certain sample of all indicators available. Also, this research utilizes pragmatism as a research philosophy, and it is implemented as a case study with questionnaire. Methodology and research methods of the study are described in more detail in Chapter 4.

1.5 Structure

Thesis includes four parts which are introduction, theory part, empirical part and conclusions. The first part of the study is introduction which represents starting points, objectives and outlines of the research. The second part of the study is theory which consists of the chapters two and three. Third part is the empirical part of the research that presents research methodology and data and the results of the study. The fourth part includes chapters six and seven that is to say conclusions and summary of the research. The structure of the study is presented in more detail in Figure 1.

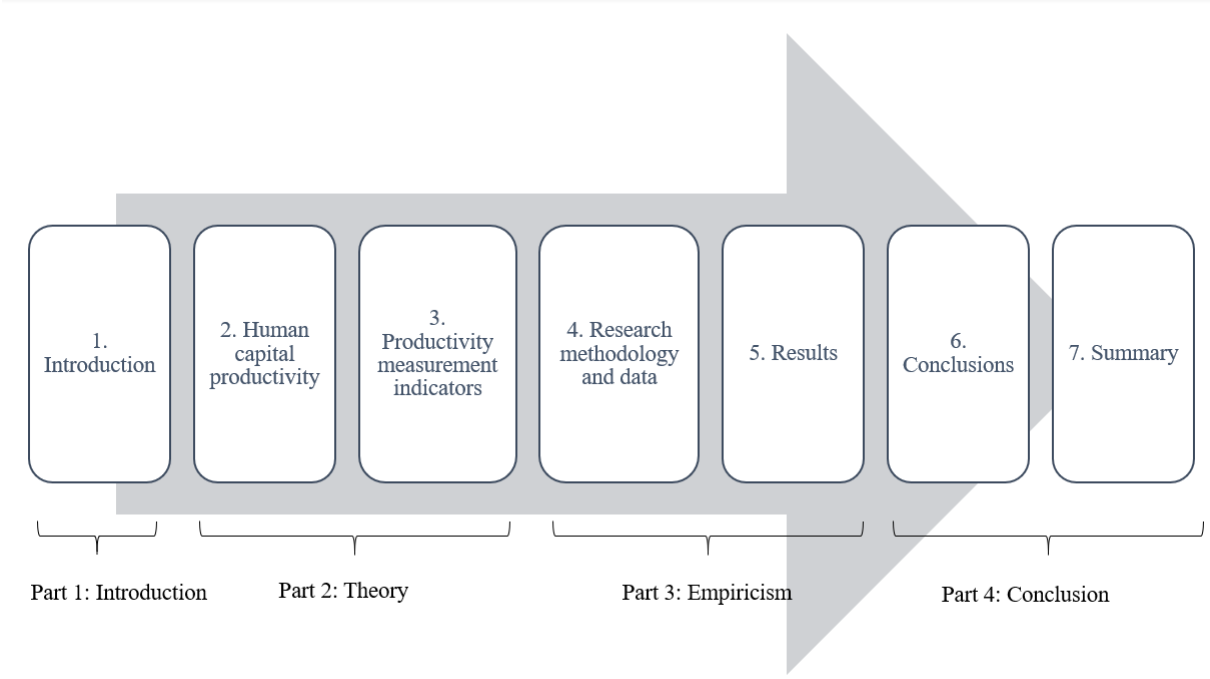


Figure 1. *The structure of the study*

The first chapter of the study presents background and basis for the research as well as defines the research problem. Research problem is described with main research question and lower research questions. Research scope and limitations are also presented.

Theory of the study consists of chapters two and three. Chapter two is focusing on human capital productivity. It introduces the concepts and definitions for human capital and human capital productivity and presents the impact and importance of them for organizations. Chapter two also examines the measurement of intellectual capital and human capital productivity. In turn, chapter three is focusing on indicators to measure human capital productivity. Chapter introduces different indicators for human capital productivity. Each indicator is presented one by one and it is considered what features each metrics has and in what kind of situations they can be used.

Chapter four examines research methodologies and data implemented in this study. Chapter introduces research philosophy, research approaches, methods and strategy selected for this thesis. Techniques and procedures used for data collection and analysis are also presented. In turn, chapter five presents the actual results for the research that are based on the collected and analysed data. As a result, chapter five presents selected set of indicators for the human capital productivity measurement in the target company.

Chapter six introduces the conclusions for the study. In this chapter, results are reflected to the theory part of the research. Chapter also presents success parts and development areas of the research and discusses about the needs for future research. The last chapter of the study, chapter seven, includes the final summary about the contents of the research.

2. RESEARCH METHODOLOGY AND DATA

2.1 Scientific framework of the research

This chapter represents the research methodology, methods and techniques used in this study. According to Saunders et al. (2015, p. 4), research methodology is a concept that refers to the theories and philosophies of where the research is based on and how the research should be implemented. In turn, methods refer to procedures that are exploited to acquire and analyse data such as statistical and non-statistical analysis techniques. Research is a multi-stage process to which these choices can bring some outlines and systematic. This study utilizes the research "onion" developed by Saunders et al. (2015, p. 124) as a scientific framework for the research. Onion depicts the issues in the context of choosing data collection techniques and analysing procedures. The research onion is presented below in Figure 7.

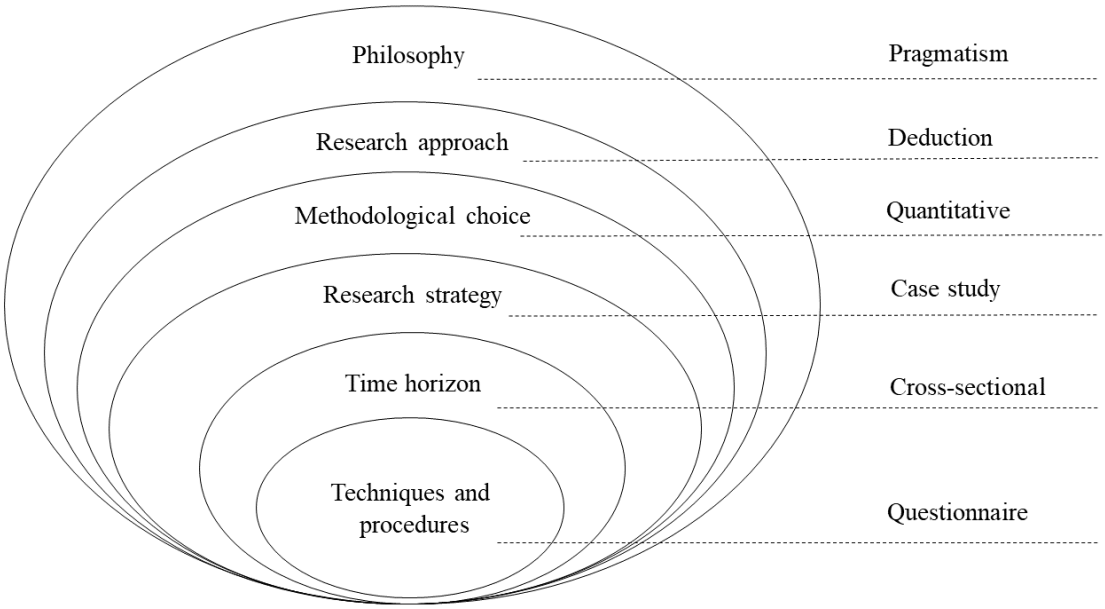


Figure 2. *Scientific framework for the research (retelling Saunders et al. 2015)*

The research onion consists of six different layers. The outermost layer, research philosophy, acts as a basis for the framework. From outer layer to inner layer, framework proceeds from research philosophy to approaches, strategies, method choices, time horizons and finally to data techniques and procedures. The selected options for each layer in this thesis are presented in Figure 7. In the following chapters, the choices of the different layers in this study are also explained in more detail.

2.2 Research philosophy

According to Saunders et al. (2015, p. 124), the term research philosophy applies to the assumptions about the development of the knowledge. They state that chosen philosophy includes the assumptions about the researcher's way of view the world that will also has an impact on the all the aspects of the research project (Saunders et al 2015, p. 151). Research philosophy will also promote the choices on methodological alternatives, research strategy, data collective and analysis techniques for the researcher. (Olkkonen 1994, p. 15; Saunders et al 2015, p. 125) Research philosophy helps to implement a consistent and cohesive research throughout every stage of the study and it influences how we comprehend our exploration (Saunders et al. 2015, p. 124).

Choosing the most suitable research philosophy depends largely on the research question or questions of the study (Saunders et al. 2015, p. 162). Currently, there are no specific philosophy that is agreed as the best choice for business and management research (Saunders et al. 2015, p. 125). Thus, Saunders et al. (2015, p. 135) present five major philosophies which are positivism, critical realism, interpretivism, postmodernism and pragmatism. This research utilizes pragmatism as a research philosophy. Pragmatism claims that concepts and knowledge is relevant when it enables actions to be carried out. Pragmatic researches start with a problem, and they focus on contributing solutions that have impact on organisational practise. (Saunders et al. 2015, p. 137, 143). In this research, the main objective is to find the most suitable indicators for human capital productivity measurements, so the focus of the study lies strongly on the research problem. Additionally, the outcome of this research is to find out a group of indicators for the target company in order to help them to focus more on the development of their human capital. Due to these facts, the research philosophy of this study can be stated as pragmatism.

2.3 Research approaches

Research approach explains the relationship of the research with theory. The most typical research approaches are deductive and inductive approaches. Deductive approach is largely what is reckoned as scientific research and it is predominant approach in the natural sciences. Deductive research starts with theory from the literature and the theory is tested with a designed research strategy. (Saunders et al. 2015, p. 144-146) In turn, Inductive approach is typical for empirical research where phenomena concerning the whole population are concluded statistically among individual cases. (Olkkonen 1994, p. 29-30) With inductive approach researches, data is collected from various sources and

theory is developed as the result of the data analysis. In addition to deductive and inductive approaches there is also a third approach named abductive reasoning. In abductive approach research, know premises are used to generate testable conclusions (Saunders et al. 2015, p. 144). Different features of the deductive, inductive and abductive approaches are presented more specifically in Table 4.

Table 1. *Differences between approaches (retelling Saunders et al. 2015, p. 145)*

	Deduction	**Induction**	**Abduction**
Logic	When the premises are true, the conclusion must also be true	Known premises are used to generate untested conclusions	Know premises are used to generate testable conclusions
Generalisability	Generalising from the general to the specific	Generalising from the specific to general	Generalising from the interactions between the specific and the general
Use of data	Data is used to evaluate propositions or hypothesis related to an existing theory	Data is used to explore a phenomenon, identify themes and patterns and create a conceptual framework	Explore a phenomenon, identify themes and patterns, locate this in a conceptual framework and test this through data collection
Theory	Theory verification or falsification	Theory generation and building	Theory generation or modification

This research utilizes deduction as a research approach. In this study, the data collection is based on one take sample and researcher is independent of what is being researched as Saunders et al (2015, p. 149) states as features of deductive approach. According to Williams (2007) and Saunders et al. (2015, p. 146), deductive research starts with a problem statement and it is used in response to relational questions which can also be seen in this research. Human capital productivity is first operationalised as measurable

indicators after which enables it to be measured. Operationalisation of the concepts is also mentioned as an important characteristic of deductive approach by Saunders et al. (2015, p. 146).

2.4 Research method

Research methods typically refer to quantitative and qualitative data collection techniques and data analysis procedures in the research. The simplest way to differentiate these methods is to focus on whether the research is focused on numeric data or non-numeric data. Quantitative research methods are related to data collection techniques and analysis procedures that uses or generates numerical data. These may include e.g. questionnaires that generate statistics or graphs. In turn, qualitative methods deal with techniques and procedures that result in non-numerical data such as words, pictures or videos. (Williams 2007; Saunders et al. 2015, p. 164-165) In spite of the common division, Tashakkori & Teddlie (2003) state that qualitative and quantitative methods are not isolated from each other. This is due to a fact that in reality many research designs in business and management combine qualitative and quantitative elements. (Saunders et al. 2015, p. 165)

Research method for this research can be stated as quantitative. According to Williams (2007), quantitative research is typically associated with highly structured data collection techniques. However, also data about the people, organizations as well as data based on opinions can be affiliated to quantitative research. Saunders et al. (2015, p. 166) describes these types of data collection techniques and their results as ‘qualitative numbers’. Collected data in this study is based on opinions of the respondents of the questionnaire and the purpose is to find the concrete solution for the research problem in this specific target organisation. As Williams (2007) notes, quantitative research creates meaning through objectivity in the collected data instead of making sense about the phenomenon being studied. This research is also mono-method quantitative study, as it uses single questionnaire for data collection.

2.5 Research strategy

According to Hirsjärvi et al. (2007, p. 128), research strategy refers to the totality of the chosen methodological solutions in the research. It can be defined as a plan of actions to achieve a goal of the research. (Saunders et al. 2015, p. 177) In other words, research strategy will map out how one is going to answer the research question set in the re-

search problem of the study. Saunders et al. (2015, p. 177) also note that research strategy acts as a methodological link between research philosophy and the selection of methods to collect and analyse data after. There are number of different research strategies presented in the literature. Yet Hirsjärvi et al. (2007, p. 130) states that the most traditional research strategies are experimental study, survey study and case study. In addition to these, Saunders et al. (2015, p. 141) presents action research, grounded theory, ethnography, narrative theory and archival and documentary research as research strategies.

This research uses case study as a research strategy. According to Yin (2013) and Saunders et al. (2015, p. 184) a typical case study is in-depth inquiry which topic is set in a real-life context. In the definition of case study, a word ‘case’ can refer to a person, a group, an organisation, an association and so on. (Saunders et al. 2015, p. 184) As this research investigates problem and phenomenon in specific target organization, its research strategy can be identified as a case study and more specifically as a single embedded case. Research is implemented within one target organisation that leads to the fact that it can be. Additionally, this research focuses on executing the study for human resources and finance departments of the organization. Since the research is concerned on some units within the organization, the study can be called embedded case study. (Saunders et al. 2015, p. 214)

However, there can also be seen some features of a survey strategy in this research. In a survey strategy it is common to use questionnaires in data collection that is also used in this research. Survey strategy is also typically associated with deduction (Saunders et al. 2015, p. 184), which acts as a research approach of this study. Saunders et al. (2015, p. 185) state that survey strategy is also undertaken in real-life setting, but due to the target organisation, a case study was select for the research strategy in this study.

2.6 Time horizons

Saunders et al. (2015, p. 200) state that time horizon of a research can be either cross-sectional or longitudinal. The choice of the time horizon depends on whether one wants the research to consider particular time or a representation of events over a particular time period. Saunders et al. (2015, p. 201) also note that time horizons of the research design are independent of research strategy. Cross-sectional time horizon comprises with the study of a particular phenomenon at a certain time and it can be described as a snapshot taken on a specific moment of time. Longitudinal time horizon research change and development during a certain time period which can be for example couple of

months, a year of a few years. Longitudinal time horizon can be seen as a diary perspective of a particular time.

Time horizon of this research is cross-sectional horizon. Regardless that the calculations for the different indicators are made for accounting period of one year, the time period of research itself is a snapshot. As the purpose of this research is to resolve the most suitable indicators for the target company, the study is investigating a specific phenomenon at a certain time. Saunders et al. (2015, p. 200) also state that cross-sectional studies often use surveys and questionnaires, which is also the case in this research.

2.7 Techniques and procedures

Techniques and procedures for the research include the data collection and analysis of the study. This chapter represents the reasoning for the chosen data collection technique, the structure of the questionnaire as well as the target group selected as respondents. The structure and reasoning for the data analysis of the collected data is also described in this chapter.

2.7.1 Data collection

A questionnaire is the most used data collection technique in within a survey strategy, but it is also largely utilized in experiment and case study researches. Saunders et al. (2015, p. 437) define a questionnaire as a method that collects data by asking each person to respond to same group of questions in a predetermined order. Therefore, this definition comprises questionnaires where the interviewer is being present such as face to face and telephone questionnaires as well as the ones without an interviewer, such as internet questionnaires.

In this research, data collection is implemented through self-completed questionnaire, more specifically web questionnaire. This was selected as a collection technique by reason of busy schedules of the respondents. When using web questionnaires, the respondents can decide themselves the time when they want to answer to it. Reliability of web questionnaire is high and questions are often closed and not too complicated. Also, because the questionnaire is implemented in a real-life case organization, the response rate can be assumed to be fairly good. Additionally, using web software makes answering pleasant for the respondent as well as analysing the results interesting and easy for the interviewer. (Saunders et al. 2015, p. 441) This questionnaire was executed with Google Forms –tool which is can be used when collecting and organizing information for

questionnaires, newsletters, registrations and polls. Google Forms was selected due to its good availability and usability.

The respondents for this questionnaire are restricted to human resources and finance departments of the target organization. As the goal of this research is to find out the most suitable indicators for human capital productivity measurements in the target organisation, it is reasoned to limit the respondents to such people with knowledge about the topic and theme of this research. Despite that the number of respondents (23 employees) for this questionnaire is quite low, for the quality of the results it was considered preferable to only include those employees as respondents who are familiar with human capital and economic figures. As a conclusion, it can be said as the non-probability sampling, mores specifically purposive sampling, where the sample is based on the researcher's own judgement. (Saunders et al. 2015, p. 724)

Quite typically, questionnaires use quantitative questions to be able to clarify the analysis of the research the best way possible. The term quantitative refers to the possibility to be able to analyse the responds on numerical scale. (Saunders et al. 2015, p. 446) Questionnaire in this research utilizes list questions, category questions and open questions. In the beginning of the questionnaire, there are two category questions about the unit that the respondent is working and the organizational position of the respondent. Saunders et al. (2015, p. 445) note that demographic questions are important when making sure that the results of the questionnaire are not distorted. Demographic are implemented as category questions where a respondent can choose only one category. This also makes data analysis simple. A list question is used to find out the respondents' opinions on the most suitable indicators. Due to the rather high number of the indicators (12), it was considered preferable to build the questionnaire in such way that the respondents get to choose four to five indicators they think are the best ones to measure human capital productivity in the organization. Other options will be left blank. List question was chosen to be used instead of rating and ranking questions. An open question is provided in connection with each indicator to enable the respondent to justify his or her answer. The form of the questionnaire for this research can be seen in Appendix A.

2.7.2 Data analysis

Saunders et al. (2015, p. 496) note that quantitative data in its raw form does not give much meaning itself. That is why quantitative data should be processed and analysed to turn it into useful information. Quantitative data can be analysed with different techniques for instance tables, graphs and statistics. Therese techniques are helping to describe, present and examine different trends and relationships in data.

In this research, data analysis is implemented with Microsoft Excel. Due to the nature of the questionnaire of this study, the analysis of the collected data is rather simple. The sampling for the questionnaire is small and the number of questions presented is not high. So, the amount of collected raw data is so little that it does not require complicate calculations nor analysis. That is why more advanced analysis software such as IBM SPSS Statistics and Statview were decided to be left out.

Category questions of the questionnaire present categorical data that refer to data whose values are not possible to measure numerically (Saunders et al. 2015, p. 499). Instead, categorical data can be classified into maximum of two categories. More specifically, this type of data is classified as descriptive dichotomous data. Therefore, in this study, category questions are being analysed with frequency distributions that show the division of one variable by summarizing data. Frequency distributions are presented with help of tables and pie charts.

Data received from the list question presents ranked ordinal data. Like descriptive dichotomous data, it is also categorical data. Regardless of the descriptive nature of the data, it is possible to count the number of occurrences in each category of the variable. This makes it compatible to use in order to find the most suitable indicators for the target company. Data is analysed presented by comparing cumulative totals of the categories with tables and bar graph charts. Also, frequency distribution is presented.

Open questions present the qualitative data collected with questionnaire in this study. Again, as the number of respondents is so small, there is no need to use any computer-assisted qualitative data analysis software. The analysis is made by implementing a simple summary of the received responses. This is done by identifying repeating themes and topics in the answers given by respondents.

3. HUMAN CAPITAL PRODUCTIVITY

3.1 Human capital as an intangible asset

During the past decades, the production model of enterprises has evolved from the exploitation of physical resources to the high-technology production of intangible assets in all industrialized countries. The importance of intangible assets has grown over the years partly as a result from the increase of non-physical capital and particularly due to the growing amount of information and knowledge in whole society. This growth has become a global phenomenon, and especially in service-based companies the significance of the intangible assets is massive. (Lönnqvist et al. 2005)

Nowadays the prosperity and success of companies lean strongly on their intangible assets (Lönnqvist et al. 2015). According to Hayton (2004), the importance of intangible assets is particularly evident for the companies operating in competitive environments where the capability to acquire new markets and technological capabilities is vital in order to achieve competitive advantage. Recently, companies have discovered the importance of intangible assets and understood their benefits when differentiating themselves from the competitors. (Stewart 1999, p. 5; Kannan & Aulbur 2004; Kesti & Syväjärvi 2015)

As a phenomenon, intellectual capital has been studied for long, (Brooking 1996, p. 12) yet there is not one unambiguous definition to it. Stewart (1997, p. 5) defines intellectual capital as a sum of everything that everybody in an organization knows that gives it a competitive edge. He also states that intellectual capital includes intellectual material, such as knowledge, information and intellectual property and experience that can be used in order to create wealth. In turn, according to Lönnqvist et al. (2005, p. 18), intellectual capital refers to the organization's non-physical sources of value which produces benefits in the future. Again, Brooking (1996, p. 12) considers intellectual capital as company's intangible assets that enable it to function. It can be noticed that despite the lack of common definition, presented depictions for intellectual capital are quite consistent as they all emphasize their effect on value and wealth creation in the future.

Typically, intellectual capital is studied in more detail through its components. Stewart (1997, p. 75) divides intellectual capital it to human capital, customer capital and structural capital. Also, Lönnqvist et al. (2005, p. 31) and Diaz-Fernández et al. (2015) separate intellectual capital to three parts; human capital, relations capital and structural capital. Regardless of the difference, Stewart (1997, p. 77) also notes that in his definition of customer capital, it can be broadened to relations capital by including value of suppliers

to the concept of customer relations. Whereas Brooking (1996, p. 13) splits intellectual capital into four categories instead of three. Those categories are human-centred assets, infrastructure assets, intellectual property assets and market assets. Stewart (1997, p. 75) also notes that each capital reflects knowledge assets of the company and they can be measured and targeted for investment by managers. In this research, intellectual capital is considered as the combination of human capital, relations capital and structural capital. The division is presented in Figure 2.

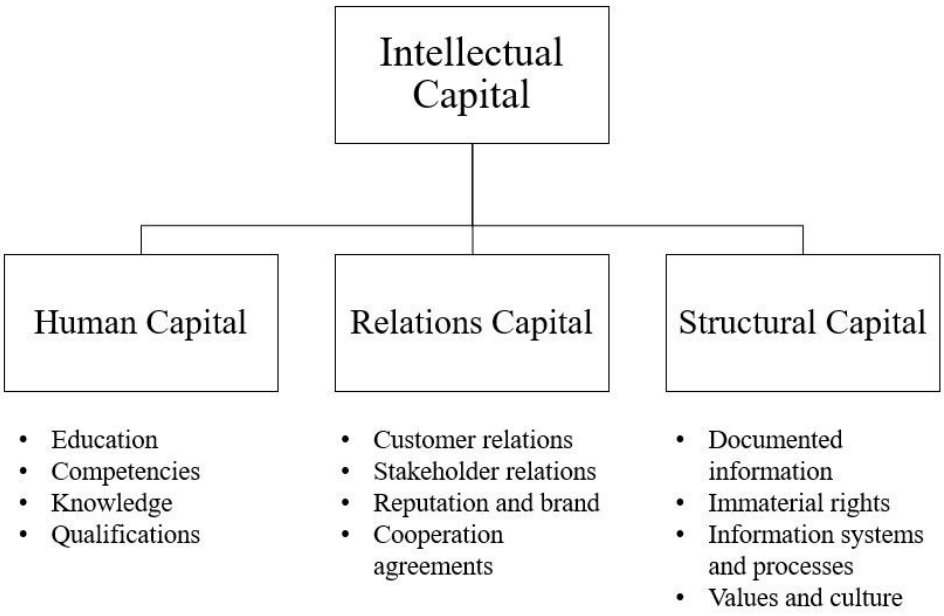


Figure 3. *The division of intellectual capital (Retelling Stewart 1997, p. 76; Lönnqvist et al. 2005, p. 31)*

As it can be seen in Figure 2, intellectual capital can be managed by dividing it into human capital, relations capital and structural capital. Structural capital refers to such organizational capabilities that enable organisation to meet market requirements. These capabilities include for instance information systems, knowledge of market channels and processes that enable sharing, transporting and leveraging knowledge. Structural capital wraps up human capital and permits so that they can be used again in order to create value. (Stewart 1997, p. 76) Lönnqvist et al. (2005, p. 31) also includes company values and culture to structural capital. He states that assets related to structural capital tend to remain in the organization though a single employee would quit. Like human capital, structural capital can only exist in a context of a strategy, a purpose, a destination and so on (Stewart 1997, p. 76).

Relations capital includes the assets related to organization's internal and external stakeholders (Lönnqvist et al. 2005, p. 31). These consist of relations for customers, other

stakeholders, cooperation agreements as well as brand and reputation. Even though Stewart (1997, p. 76) considers this part of intellectual capital as customer capital, he also notes that by including value of relationships with other parties, such as suppliers, the concept can be broadened to relations capital. Customer capital itself can be defined as the value of a company's relationship with the people it does business with (Stewart 1997, p. 77). However, in both cases, relationships with customers turns the intellectual capital into revenue. Due to the relation to the revenue stream, customer capital is measured and accounted more often than human and structural intellectual assets.

Human capital refers to the assets related to employees and management of the organization (Lönnqvist et al. 2005, p. 31). According to Baron & Armstrong (2007, p. 5), human capital infers to the added value that people provide to the companies. Unlike structural capital, human capital is owned by individuals, so the organization cannot manage it (Stewart 1997, p. 77; Lönnqvist et al. 2005, p. 31). Therefore, human capital can be seen as the most critical type of intellectual capital. Human capital includes matters such as education, knowledge, attitude, characteristics and competencies. In turn, Brooking (1996, p. 47) divides the aspects of human capital into education, vocational qualifications, work related knowledge, occupational assessments and psychometrics and work-related competencies. In this research, human capital includes all the characteristics that are involved with the productivity of human capital.

3.2 Human capital importance and impact on organization

Many of the resources and development actions related to intellectual capital are not itself new phenomena (Kujansivu et al 2007; p, 38). However, the impact of it has increased significantly during the past years. Some reasons for this are the increased amount of information and know-how in companies as well as the increase of knowledge work in general (Kujansivu et al 2007; p, 38). That is why the importance can be noticed the most in highly intensive knowledge and advanced technology sectors (Diaz-Fernández et al. 2015). The growing difference between book value and market value of the companies also implies the increasing significance of it (Stewart 1997, p. 61; Kujansivu et al. 2007, p. 37). A good example of this is Nokia with a market value 2,7 times higher than current book value in 2007. Thus, importance of intellectual capital varies for instance based on the business industry. It is underlined in knowledge-intensive branches such as consulting and design. In electronics industry, the share of intellectual capital is 1,28 times higher comparing to tangible capital. (Kujansivu et al. 2007, p. 39)

Multiple studies (Boudreau 1999; Fitz-ens 2000, p.1; Chang & Huang 2005; Betchel 2007; Kalkan et al. 2014; Kesti & Syväjärvi 2015) identify human capital as the most

important asset in an organization. According to Stewart (1997, p. 75), human capital is significant because it is the source of renewal and innovation, which can be anything from brainstorming to sales rep's new leads from his or her own network. Brooking (1996, p. 46) notes that valuable human assets are the ones that support the company to respond to market pull. This means generating new strategies, creating new products, services and technologies that can push the market. The different impacts of human capital are described in Figure 3.

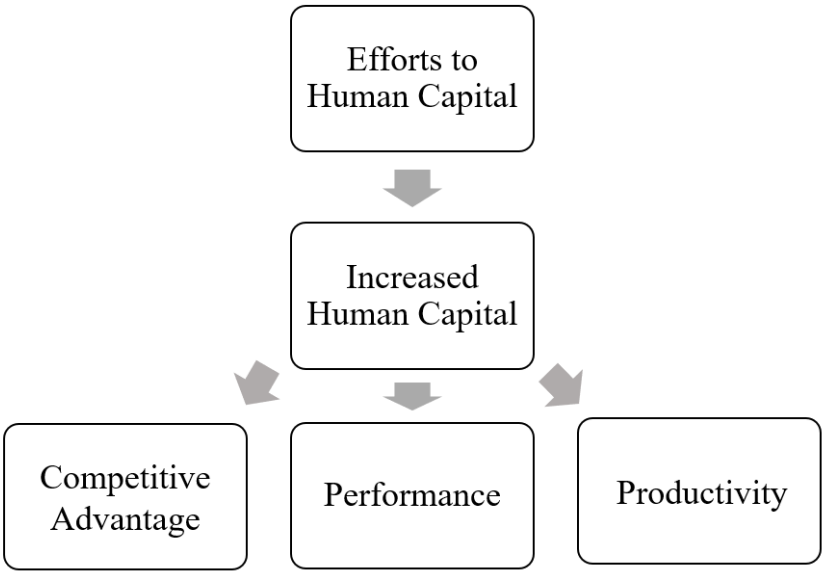


Figure 4. *Human Capital impacts on a company*

Figure 3 presents the impacts of human capital to the company. Based on the literature, these are identified as competitive advantage, performance and productivity. By investing to human capital, human assets are being increased and the impacts improved and accelerated. According to numerous studies, human capital is seen as the most valuable asset for companies when gaining competitive advantage (Iveta 2012; Kesti 2012; Berzkalne & Zelgalve 2013; Kesti 2013; Liu et al. 2014; Weresa 2014, s. 53; Kesti & Syväjärvi 2015). The major factors concerning competition are human, their creativity, knowledge, skills and ability to convert those into an innovation (Weresa 2014, s. 53). The success is based on the complex combination of individual's knowledge (Lönnqvist et al. 2005), and human capital is becoming increasingly important factor for companies to succeed in a competitive environment (Weresa 2014, s.54).

Human capital is also seen as the most valuable factor for business performance (Crook et al. 2011; Kesti 2012; Kesti 2013; Kalkan 2014). Kalkan et al. (2014) state that processes that relate to training and education, which aim to increase individual's knowledge

and abilities, will lead to employee's satisfaction and performance. Consequently, this will eventually direct to a company's performance.

Kujansivu et al. (2007, p. 40) state that intellectual capital, which includes human capital, indirect impact on company's productivity and direct impact on company's profitability. Investments in intellectual capital have led into better productivity and profitability in Finnish companies. Stewart (1997, p. 85) as well presents that 10 percent increase in workforce education level can lead into an 8,6 percent benefit in total productivity. Also, Kalkan et al. (2014) note that human capital is a key element when it comes to increasing productive advantage. Stewart (1997, p. 85) presents that 10 percent increase in workforce education level can lead into an 8,6 percent benefit in total productivity. Compared to investing in machinery, also the margin value is about three times higher when investing in human capital.

Consequently, human capital should be recognized as one of the most important concepts to be track on in the organizations. By investing and developing human assets, companies can gain more competitive advantage and improve their productivity and organizational performance. Also, as human capital is not owned by individuals, not companies (Stewart 1997, p. 77; Lönnqvist et al. 2005, p. 31), employees can leave the organization and take their knowledge, skills, competencies and creativity with them.

3.3 Productivity as a concept

The improvement of the productivity is the foundation to the wealth creation in companies and it is a central factor affecting and maintaining the competitiveness and profitability of a firm (Lönnqvist 2007). Improving productivity increases economic growth, creates the conditions for rising living standards and reduces the pressure on price increases and improves competitiveness (Uusi-Rauva 1997, p. 15). Above all, productivity is a personal, positive attitude towards progress that always strives to improvement of the current situation and state. It is about constantly adapting to chancing human and economic conditions. (Uusi-Rauva 1997. p. 13)

Productivity as a concept is used in many contexts and there are many different contents related to it. There are various ways to answer the question what productivity is. For a company, it means improving the cost-effectiveness. However, the core issue of productivity is how the input invested on the activity can produce the maximum output possible. (Uusi-Rauva 1997, p. 16) The principle of the productivity is described in Figure 4.

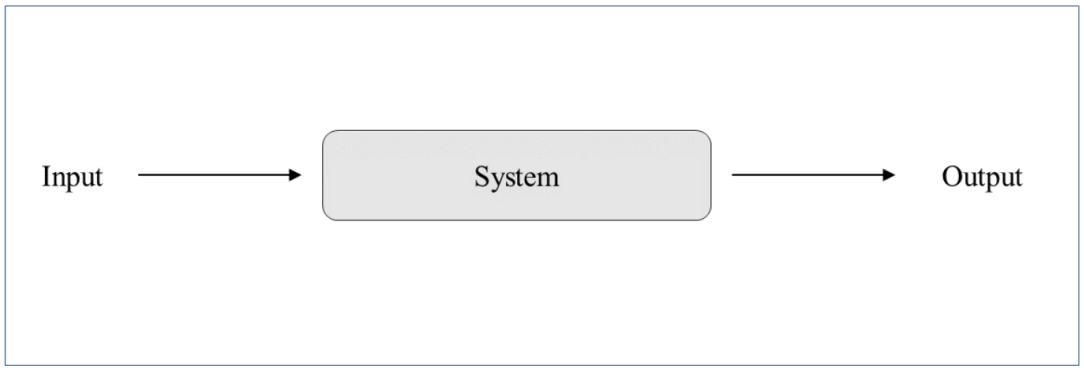


Figure 5. *The components of productivity (Retelling Uusi-Rauva 1997, p. 19)*

Figure 4 represents the components of productivity. This design can be found quite similar to the real process of the company's economic process. For a business economist, productivity as its simplest can be defined as the relation of output and input. (Uusi Rauva 1997, p. 16) Productivity is the general concept for reviewing the relation of outputs and the inputs invested to achieve them during selected time period in an examined target or a system (Uusi-Rauva 1997, p. 19). Productivity can also be described as what can be produced with material, capital and technology (Uusi-Rauva 1997, p 13).

In order to develop productivity, the targets and supportive, simple and understandable metrics should be passed through the entire organization (Uusi-Rauva 1997, p. 17). Measuring productivity is calculation of different relations of outputs and inputs. The goal is to obtain measurement numbers for both output and input quantities in order to implement suitable measurements. The relation indicates the level of productivity. Another important target of productivity is the change in productivity during different time periods. At the level of economic unit, productivity can be considered as a measure of the unit's production capacity, which shows how efficiently the inputs are utilized in the production process. (Uusi-Rauva 1997, p.21)

Uusi-Rauva (1997, p. 19) also states that productivity needs to be observed extensively, taking into account all features related to it. However, different operators may focus their attention on tracking productivity only for a particular level of view. The starting points of the company's productivity include the input of its employees, including indirect employees, skills and know-how and technology. (Uusi-Rauva 1997, p. 19) The output itself is actually made at the level of individual employees and level of production. On the other hand, the conditions for productivity are significantly influenced by generally higher decision-making levels, such as those where investment and other development decisions are made. (Uusi-Rauva 1997, p. 17)

Typically, productivity as a concept is not tied to money but more generally to hours or other units. However, if input and output of productivity are denominated in euros, many of the productivity indicators actually can be seen as profitability indicators. Also, according to Uusi-Rauva (1997, p. 26), profitability is essentially related to productivity. It is a more established concept than productivity and its definition is more unanimous even though there are many profitability indicators available. (Uusi-Rauva 1997, p. 26) Profitability can be measured by dividing profit by revenue or production, or in other words, with input. Profitability can also be calculated by dividing income with costs, or in turn, by dividing profit with expenses (Uusi-Rauva 1997, p. 27).

3.4 Human capital productivity

Human capital productivity is a wide concept and there is not an unambiguous definition for it. This research utilizes Kesti's (2010, p. 15) definition of human capital productivity. He states that human capital productivity refers to the return on investment made on employees. Aura et al. (2015, p. 5-6) define human capital productivity as an ability of an individual to productive work. It is also connected to both financial outcome and to welfare of employees. Aura et al (2015 p. 6) also state that human capital productivity is a personal character of an individual, which consists of know-how, motivation and ability of the work. In addition, human capital productivity is significantly influenced by organizational phenomena such as leadership, atmosphere and company culture. The concepts of human capital are presented in Figure 5.

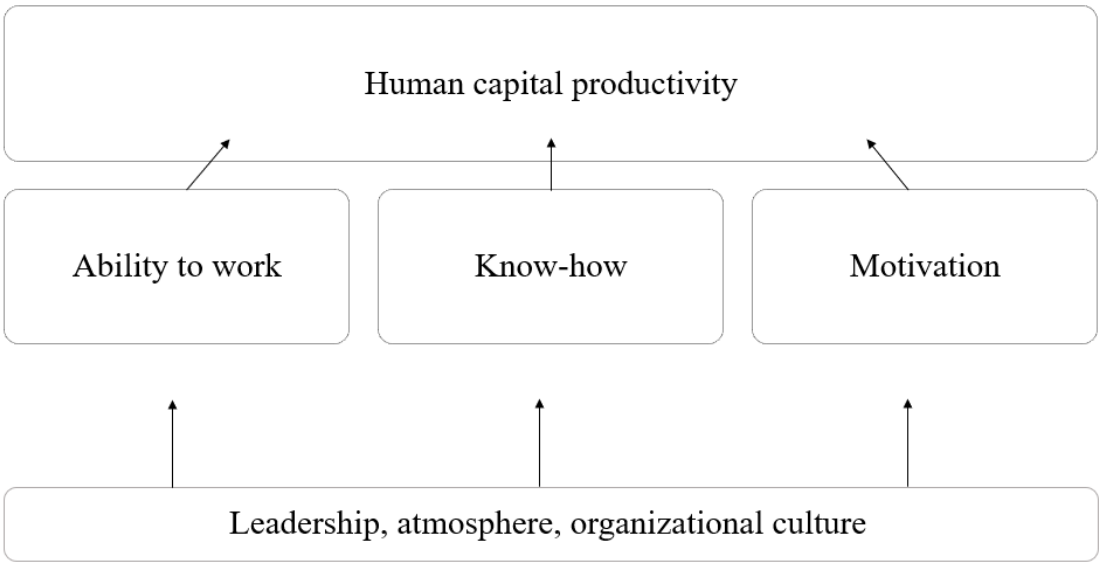


Figure 6. *The concepts of human capital productivity (retelling Aura et al. 2015).*

The concepts influencing human capital productivity are described in Figure 5. According to Aura et al. (2015, p.5-6), ability to work is the basis for all work. It is a comprehensive content which includes elements from individual, community and even society. However, it is also always tied to a specific work task. A lack of ability to work is always a medical phenomenon. According to Kesti (2010, p. 171), this is also influenced by conflicts between individuals and constant work stress. He notes that it is significantly important that employer takes responsibility for the early care model and reacts rapidly to the problems regarding ability to work. Usually, there occurs a lot of absence for an employee that is prone to loss of ability to work Kesti (2010, p. 173).

According to Aura et al. (2015, p. 5-6), know-how in turn, is based on good school and education system as well as on further education and the experience accumulated during one's career. Know-how is an important feature of human capital productivity, as an employee with know-how is able to work more effectively (Kesti 2010, p. 17). Know-how, like ability to work, is task-specific and changing quickly. However, Kesti (2010, p. 148) notes that know-how is useful only when it can be utilized. Alongside know-how, the sense of control and the possibilities to have an impact on things create the conditions for utilizing know-how in business (Aura et al. 2015, p. 5-6). According to Kesti (2010, p. 148) know-how should not be controlled but rather released to organization to be used. Individual's competences develop when he or she interacts with other members of the work community. Sharing know-how also increases learning as it creates the feeling of success which is emphasized by the positive feedback of co-workers. Organizational culture has a great impact on the willingness to share know-how. (Kesti 2010, p. 148)

Motivation is the third component of human capital productivity. It consists of internal and external motivation – internal is based on the work itself and the good that it produces. In turn, external motivation is supported with salary and other benefits. A motivated employee does his or her work better with better outcome as well. (Aura et al. 2015, p. 5-6) Kesti (2010, p. 171) notes that absences due to sickness tell about the status of motivation and comping in the workplace. This is because employee's own opinion about his or her ability to work effects the most on the decision about stay away from work.

3.5 Human capital measurement

3.5.1 Measuring human capital

Metrics and indicators are concrete tools for management. They enable controlling of complex contents by summarizing the results in a simple form of figures (Kujansivu et al. 2007, p. 159). It can be stated that common statement, 'What you can't measure you can't manage', is at least partly true. The phenomenon that is to be managed should be controlled at some level – otherwise it might be impossible to direct its action. There can be various reasons for measurements depending on the company. Indicators provide accurate information about the status of the company compared to the defined business goals. Therefore, the purpose is to control that the planned matters are being implement in practise. Metrics can also produce information to support the decision-making, to question the modes of operations, to set the basis for compensation, anticipate the development of business and so on. (Kujansivu et al. 2007, p. 160)

According to Kujansivu et al. (2007, p. 161), measuring and managing intellectual assets is challenging as they are non-physical, invisible matters. Additionally, intellectual assets are often subjective phenomena. Also, they cannot be clearly linked to any transaction that justifies the measurement of economic matters. Intellectual assets, such as costs, are tangible matters that can be measured objectively and accurately. However, with intangible assets the measurement can be far more indeterminate. For example, with asset such corporate culture, it is challenging even define what does it consist of and what is the correct unit for it.

According to Kujansivu et al. (2007, p. 164) there are many ways to measure intellectual capital. He presents the classification of different ways for measuring intellectual capital. This division is presented in more detail in Table 1.

Table 2. *The features of different ways of measuring intellectual capital (retelling Kujansivu et al. 2007, p. 164)*

Corporate-level metrics	**Monetary value indicators**	**Scorecards**	**Non-financial figures**
Aims to describe the status of intellectual capital	Goal is to describe monetary value of intellectual capital	A method for examining intellectual capital as individual resources	Includes large number of indicators

At least partly based on accounting data	Largely corporate-level indicators	Several indicators to be selected	Aims to directly or indirectly provide information about intellectual capital
Reliability is questionable. Not valid for supporting development	Same restrictions	Management is done by reviewing the results of individual metrics	Typical example is customer satisfaction index

Table 1 presents the classification for measuring intellectual capital. These are divided in to corporate-level metrics, monetary value indicators, scorecards and non-financial figures. According to Kesti (2010, p. 15), human capital cannot be directly measured with financial figures. This is because it includes intangible concepts such as competencies, business processes and organizational structures. However, Kesti (2010, p. 15) notes that despite this, the success of a company lies on the fact how well it can process its intellectual capital into measurable, tangible form. Consequently, there is a clear need for concrete metrics for measuring human capital and intellectual capital. Because of this, this research is focusing on utilizing mainly the monetary value indicators. Also, some non-financial metrics that evaluate the components of human capital productivity are included.

Iveta (2012) states that during the recent years there has been an increasing importance on human capital-based measurements. According to many studies (Fitz-enz 2000, p. 18; Hayton 2004; Nathanson 2005), it is essential that the human capital measures are strongly linked to the mission and business strategy of the company. However, Betchel (2007) states that human capital is often neglected in strategy as it is considered demanding to deal with. This is regardless the fact that human capital is widely recognized as the most relevant intangible asset in the organizations. Quantifying the value of human capital into insightful information, offers reliable evidence for the decision-makers (Fitz-enz 2000, p. 11).

According to Stewart (1997, p. 59), company's accounting is based on the costs and it assumes that costs state fairly what acquired asset is worth. He notes, that this model falls apart when it comes to intangible assets. Stewart (1997, p. 56) also states that accountants are not able to count intellectual capital. However, Fitz-enz (2000, p. 8) states

that without data on human capital and its productivity, it is not possible to compete effectively. Human capital cannot be considered as a strategic success factor before the monetary value of it can be calculated (Betchel 2007). Thus, Fitz-enz (2000, p.11) also notes that besides the quantitative measures there are qualitative measures related to human capital that should be taken in consideration.

3.6 Human capital productivity measurement

It is not simple nor effortless to measure the productivity of indirect employees such as people working in professional-level activities or in services (Fitz-enz 2000, p. 31). According to Lönnqvist (2007), intangible asset inputs such as knowledge and competence cannot be consumed similarly as tangible resources. This is mainly because the input and output of salaried employees are typically information, insights or intelligence and the value of this type of output can be factors such as quality or customer relationships (Bosh-Sijtsema et al. 2009). As most of the measurement initiatives have been executed with the indicators and methods of manufacturing industries, they are not suitable for measuring the efficiency or productivity of white-collar employees. Therefore, the productivity of intangible assets such as human capital must be measured in a different way and with paying attention to different matters (Fitz-enz 2000, p. 31).

Productivity of information-based, indirect workers is a very multidimensional concept and there is not unambiguous indicator for measuring it. In this research, human capital productivity refers to the return on the investment made for salaried employees, as it is defined by Kesti (2010, p. 15). Though human capital productivity can certainly be studied and developed through its components presented earlier in this research, for this study it was considered, that measuring its components alone, for example motivation, does not provide comprehensive enough picture about the status of human capital productivity. Also, Fitz-enz (2000, p. 13) notes that human capital productivity can be determined with invested capital. In addition, Aura et al. (2015, p. 17) note that the components of human capital productivity can help to clear out the value of human capital productivity.

However, Kesti (2010, p. 15) notes that the success of a company lies on the fact how well it is able to process its intellectual capital into measurable, tangible form. Also Bontis & Fitz-enz (2002) note that making human resources more accountable in financial terms is critical when it comes to establishing credibility with the HR as a function. Consequently, this research is focusing on utilizing mainly the monetary value indicators. In this study, valuing human capital productivity was decided to be implemented by utilizing

metrics and indicators that utilize financial statements and cost reports of the target company. The use of accounting is based on the definition of human capital productivity, as well as on the desire of the case company to be able to make data collection as easy way as possible.

According to Kesti (2010, p. 55), employee productivity is measured by dividing the actual output with the amount of work and cost. Theoretically, employee productivity can be calculated with the formula below.

$$Employee\ productivity = \frac{X + Y + Z}{Y + C}$$

Kesti (2010, p. 55) notes that in this equation, X+Y+Z in the numerator refers to the sum of utilizing competencies, technologies and workforce. In turn, denominator refers to the amount of work multiplied with the cost of work. Obviously, it is difficult to implement calculations with real-life numbers as competencies and technology are hard to measure quantitively. However, companies operating in global markets are constantly measuring their competitiveness by selling their products. Productivity is in order if selling is doing great and profit is generated. Practically, nominator can be presented with revenue of the company and denominator with full-time equivalents recounted with costs of the employee.

According to Uusi-Rauva (1997, p. 232), measuring employee productivity is usually based on the assumption that employee inputs are equal – meaning that the effect of the input produces the same output. This is not the case in real life. The hours worked by different employees or even the different hours worked by the same employee are not the same based on the level of education. For the simplification, in this research it is assumed that all the employees are equivalent in front of the financial statement. This means that it is assumed that all the employees, including direct and indirect employees, have the same impact on the produced output. As this research concerns only the salaried employees, the metrics and indicators for human capital productivity measurement have to be adjusted in such way, that they concern only this part of the workforce. This is done by adjusting some of the financial figures in accordance with these criteria.

This research focuses on processing and evaluating human capital productivity and the indicators related to it with the help of the concepts of productivity and profitability. Kesti (2010, p. 11) notes that thus productivity and profitability are different concepts, only managing productivity based on improvement of employee performance, can lead to quality errors that effect negatively to productivity in the long term. Additionally, if input and output of productivity are denominated in euros, many of the productivity indicators

actually can be seen as profitability indicators. Also, it was discovered, that in literature (Fitz-enz 2000; Kesti 2010) productivity and profitability were mixed with each other and discussed as synonyms. The indicators presented in this thesis in next chapter, are assessed based on these concepts. It is also estimated how well different metrics are compatible with to measure human capital productivity and in what kind of situations they can be used. Basis for the human capital productivity indicators and measurements in this study are collected in Table 2.

Table 3. *Starting points for the human capital productivity indicators in this thesis*

Concept	**Assessed in this thesis**
Type of measurement of intellectual capital	Mostly monetary value indicators (with some non-financial figures)
Human capital productivity definition	Refers to the return on investment made for employees
Measurement of human capital productivity	Productivity and profitability-based metrics are being discussed
Part of personnel	Undirect employees
The impact of one employee	Each employee produces same amount of output

Table 2 presents the premise for the measurement of human capital productivity in this research. To conclude, the human capital productivity defers to the return on investment made on employees and is measured by using mostly monetary value indicators. Measurements based on productivity and profitability are being discussed and the metrics in the target company are concerning undirect employees. Impact of each employee is concerned equal when reviewing produced output. The indicators for the measurements are presented and discussed in the next chapter.

4. PRODUCTIVITY MEASUREMENT INDICATORS

4.1 About the indicators

Presented indicators for human capital productivity measurement in this study are mainly based on the metrics introduced by Fitz-enz (2000) and Kesti (2010). This chapter divides these indicators roughly to monetary-value indicators and tracking meters. Calculations with monetary-value indicators are strongly based on financial figures whereas tracking meters are measuring the development of the concepts of human capital productivity. At the end of the chapter, there is a classification of characteristics and features of indicators.

Presented indicators were also used to execute example calculations for the target company. These calculations were included as graphs into the questionnaire that was used as data collection technique in this study. As figures based on statements of costs and expenses are confidential, more specific calculations are not included nor attached to this research.

4.2 Monetary-value indicators

4.2.1 HCRF

According to Fitz-enz (2000, p. 44), the most common way of assessing the financial aspects of human capital is to revise the traditional revenue per metric. In several businesses and public organisations, calculating sales per employee is the most used and common standard indicator for this. HCRF (Human capital revenue factor) is a common indicator for human productivity measurement as it measures the time that was spent to produce a certain amount of revenue (Fitz-enz 2000, p. 45). The equation for HCRF is presented below.

$$HCRF = \frac{Revenue}{FTE}$$

Fitz-enz (2000, p. 44) states that one of the problems of using HCRF is related to changing forms of employment. Formerly, most of the employees were full-time workers. Today's working life is very different from this as many people are part-time workers or so-called contingent employees that are also often referred as rented employees or agency contract workers. Rented employees are not typically on the company's payroll so they are not considered as the real employees for the firm. Despite this, they must be taken

into consideration when calculating the real representation of labor which is invested to produce revenue. (Fitz-enz 2000, s. 45) Due to these changing forms of employment, the concept of revenue per employee has formed into revenue per full-time equivalent (FTE) which consists of full-time, part-time and also contingent labour working hours (Kesti 2017).

Kesti (2017) states that human capital revenue factor indicates the amount of produced revenue per full-time equivalent in a certain period of time. According to Fitz-enz (2000, p. 4), it is also a typical indicator for human productivity measurement as it states the time that was spent to produce a certain amount of revenue. In this thesis, the example calculations of HCRF utilize net sales from the income statement instead of revenue. Also, as this thesis concerns with only salaried employees, revenue is proportioned with the percentage of the FTE of undirect employees.

It can be stated that as an indicator, HCRF is simple and suitable tool for measuring human capital productivity. It estimates clearly the relation between revenue as output with full-time equivalents as invested input, so it is quite consistent with the traditional productivity definitions. HCRF is also rather easy to calculate as both figures used in this formula are already typically followed in monthly reporting. HCRF can be used to follow the development of human capital productivity in general level. However, Fitz-enz (2000, p. 45) states that HCRF is still not advanced enough indicator for measuring the human capital and its financial outcomes. Especially when considering the measurement of productivity of salaried employees, more sophisticated indicators are needed.

4.2.2 HEVA

Human Economic Value Added (HEVA) is based on the term Economic Value Added (EVA). EVA is qualified as net operating profit after tax minus the cost of capital. The main principle of EVA is to demonstrate if the actions of management have added economic value to the company. EVA shows the amount of true profit after all expenses, taxes and invested capital has been reduced and it can be seen as a revealing calculation of managerial performance. (Fitz-enz 2000, p. 45) HEVA is conducted from EVA by dividing cost of capital by FTEs as follows:

$$HEVA = Net\ operating\ profit\ after\ tax - \frac{Cost\ of\ Capital}{FTEs}$$

As EVA proves the amount of profit after all expenses and invested capital, HEVA points that amount per full-time equivalent (Fitz-enz 2000, p. 46). Also, according to Drábek et al. (2017, p. 123), HEVA demonstrates the share that one full-time equivalent creates on

economic value added. In other words, it presents the generated wealth made by one FTE in the company. The example calculations utilize net operating profit after tax from the standard financial reports. Cost of capital includes financial items and depreciations. Since this thesis considers only the human capital productivity of salaried employees the financial figures must be proportioned with undirect employee's relative share of the total personnel. Therefore, both net operating profit after tax and cost of capital are proportioned with the amount of the relative share of undirect FTEs from all the FTEs.

To conclude, the basic logic in EVA is that a company is producing added value to its owners only after when return on capital is greater than the cost of capital. As it compares profit with related costs, it is quite typical indicator for profitability measurements. With HEVA - by sharing the amount of profit per FTE – it is possible to evaluate it in more detail. Considering the measurement of human capital productivity, HEVA also enables the evaluation of operations made by management.

4.2.3 HCCF

According to Drábek et al. (2017, p. 123), Human capital cost factor (HCCF) is an indicator that reflects the total cost of human capital. Fitz-enz (2000, p. 46-47) states that it is based on the calculation of the four principal costs of human capital. These are pay and benefit costs for employees, pay costs for contingents, cost of absenteeism and cost of turnover. On the equation form, HCCF can be determined as follows:

$$HCCF = Pay + Benefits + Contigents + Absence + Turnover$$

According to Fitz-enz (2000, p. 47-48), pay includes the total costs of compensations that is seen on employee's payslip and the add-on costs related to the pay. Pay doesn't contain incentive bonuses until they are paid out. Benefit costs are the costs that company pays to provide benefits for employees excluding the costs employees pay themselves. Typically, the pay costs for contingent employees do not include benefits expense, turnover costs or cost of absence. Also, though there are plenty ways to cope with absenteeism, Fitz-enz (2000, p. 48) suggests a measure for absenteeism by taking out one-half the value generated per hour by all jobs. If revenue per FTE per hour is 100 euros and absenteeism is 2 percent, the subtract is 1 percent or 1 euro per FTE hour. Human capital cost factor can also be processed further by dividing it per full-time equivalent.

In the target company, the simplest and quickest way to calculate HCCF is to exploit existing fixed cost monthly report of the target company which includes the total cost of

salaried employees. Salaried labour costs consist of salaries, social costs and voluntary costs. They also include employee health care costs and other benefits that target company provides for its employees. In addition, training and recruiting costs are also included as well as.

Regardless of what is included to the human capital costs, HCCF itself cannot be seen efficient enough indicator for human capital productivity measurements. Even if costs are divided with full-time equivalent, cost factor per FTE only itself is not suitable for the productivity measurements despite that the cost can also be considered as one type of output of the productivity measurements. However, this doesn't reflect the value that from the investments made on human capital truly produce. Nonetheless, HCCF is a great figure to follow in order to keep track on the total costs on human capital in general. According to Kesti (2017), successful human resource development also reduces this cost factor per FTE. Consequently, HCCF is a suitable indicator to follow the effects of made decisions related to human capital.

4.2.4 HCVA

Fitz-enz (2000, p. 50) states that Human Capital Value Added (HCVA) is an indicator for human capital productivity measurement which discusses productivity from profitability's perspective. It indicates the economic efficiency of human resource in the organization by reflecting the participation of full-time equivalents in value added (Drábek et al. 017, p. 123). Formula for measuring HCVA is presented below:

$$HCVA = \frac{Revenue - (Expenses - Pay\ and\ Benefits)}{FTEs}$$

The idea of the indicator is to sort out the profitability of the average employee. When the other, non-human expenses except pay and benefits are subtracted from the revenue the result actually is a profit figure. (Fitz-enz 2000, p. 50; Drábek et al. 2017, p. 128) The average profit per FTE is converted as the profit figure is divided by the number of FTEs. Due to this, HCVA can be alternatively calculated by summing operating profit and employment costs and dividing them with number of FTEs.

Generally, HCVA can be seen as applicable metrics for human capital productivity. It comprises full-time equivalents – the used work power of employees – as an input and the amount of profit produced as an output. Although, when comparing to the definitions of productivity and profitability, HCVA can actually be considered as profitability indicator due to the profit figure in numerator. However, in this thesis also this is included as human capital productivity indicator. According to Kesti (2017), HCVA also shows the total

effects of human resource development in employee productivity. This means that HCVA is also suitable for measuring the impacts of decision related to employees.

4.2.5 EBITDA

EBITDA (stands for earnings before interest, taxes, depreciation and amortization charges) is a typical indicator in finance (Drábek et al. 2017, p. 123). EBITDA is not in itself a direct tool for measuring human capital but it can also be exploited as a part of human accounting. Typically, EBITDA is calculated as follows:

$$EBITDA = Turnover - variable\ costs - human\ capital\ costs - \ other\ fixed\ costs$$

As it can be seen in the equation, gross margin is calculated from the turnover in accordance with normal cost accounting. Business-driven human resource development can increase the amount of EBITDA per employee. Kesti (2017) notes that EBITDA per employee can also be derived with the help of human capital measurement indicators presented before. The equation for this is presented below:

$$\frac{EBITDA}{Employee} = HCVA - HCCF$$

In the target company, EBITDA is already calculated as a part of normal income and financial statements and these measurements utilize these existing numbers. Instead of clarifying EBITDA per employee it is more desired to calculate EBITDA per full-time equivalent. In this way, the measurements are more consistent as all the other indicators utilize FTEs in exchange of typical employee headcount. According to Kesti (2017), business-driven human resource development increases EBITDA per FTE. Based on this, EBITDA per FTE can also be used in order to assess the efforts made on human capital. By dividing EBITDA per FTE, it also compatible with productivity definitions.

4.2.6 HCROI

HCROI (Human Capitan Return on Investment) is another indicator that investigates the relationship of human capital and profitability (Drábek et al. 2017, p. 129). HCROI is a spin-off from the formula of HCVA and it is a concept that observes the return on investment in the perspective of profit for money spent on employee benefits and pay (Fitz-enz 2000, p. 50). The equation for HCROI is presented below.

$$HCROI = \frac{Revenue - (Expenses - Pay\ and\ Benefits)}{Pay\ and\ Benefits}$$

By cutting down expenses besides pay and benefits, the result in numerator is actually a profit figure (Fitz-enz 2000, p. 51). Therefore, it is also possible to estimate the value of HCROI by summing operating profit with pay and benefits and diving the result with pay and benefits. HCROI indicates the amount of profit derived for every euro that is invested in human capital. (Dràbek et al 2017, p. 129) According to Kesti (2017), HCROI is the most sensitive indicator to reveal possible problems in human capital productivity. Fitz-enz (2000, p. 11) also notes that nowadays, the employee costs can range anywhere from 20 to 70 percent of the total corporate costs so it is mandatory for the companies to measure the return on investment of the human capital.

In the example calculations, HCROI was measured by utilizing operating profit figure and human capital cost factor (HCCF) that was presented earlier in this study. This decision was made due to the simplicity and effectiveness for the measurements. In general, HCROI enables valuating the impact of employees on company performance as it is measuring the financial return on an investment made on employees. When comparing to definition of human capital productivity, this makes it quite a clear metrics for measuring employee productivity. In longer time period, it is possible to assess if the human related investments have caused reductions on costs.

4.2.7 HRCCR

Human Resource Capacity Cost Ratio (HRCCR) represents an advanced indicator for human capital productivity measurement represented by Kesti (2017). He states that HRCCR notices qualitative factors of the work unlike many other productivity indicators as it takes effective working hours into consideration. The equation for measuring Human Resource Capacity Cost Ratio is presented below.

$$HRCCR = \frac{Human\ capital\ costs}{Effective\ working\ hours}$$

In the example calculations, human capital costs are considered the same as human capital cost factor which utilizes the existing monthly fixed costs report. Effective working hours denotes the hours that employees spend on actual work. Effective working hours are measured with the help of the concept of quality of working life. On the example calculations, QWL is a qualitative indicator for it is based on the results of company's HUPO test results.

According to Kesti (2017), HRCCR is a more sophisticated indicator for measuring human capital productivity as it also takes qualitative factors into consideration. However, when considering monthly reporting, HRCCR is rather challenging and time-consuming

indicator to use. Though, utilizing effective working hours instead of just full-time equivalent gives new depth to the productivity measurements. HRCCR also gives the possibility to evaluate the impacts of employee wellbeing to effective working hours and again on the human capital productivity.

4.2.8 HRBR

Human Resource Business Ratio (HRBR) is an advanced indicator for human capital productivity measurement presented by Kesti (2017). HRBR examines the relationship between the revenue of the company and effective working hours of the employees. The equation for measuring Human Resource Business Ratio is presented below.

$$HRBR = \frac{Revenue}{Effective\ working\ hours}$$

Human Resource Business Ratio defines the amount of revenue that is produced in relation to the effective working hours in a certain time zone (Kesti & Syväjärvi 2015). As in HRCCR, Human Resource Business Ratio also utilizes the effective working hours which makes it more sophisticated indicator for human capital productivity measurements. This is because like HRCCR, HRBR also takes qualitative factors of the work into account as effective working hours are calculated with help of quality of working life. Kesti & Syväjärvi (2015) also note that HRBR is both the business branch specific and firm-specific indicator that is influenced by the value-added investments in ICT, R&D and other processes.

Like HRCCR, HRBR is also rather more challenging indicator to use as the figures utilized in effective working hours are not directly collected from monthly financial statement and cost reports. However, indicators exploiting qualitative factors and in this case quality of working life, enable the assessment of the impacts of employee wellbeing on human capital productivity. Generally, HRBR is a rather typical productivity indicator as it is comparing produced revenue with hours invested in it.

4.3 Non-financial figures

4.3.1 FTE

FTE is an important factor within human capital productivity measurement as it is utilized as a part of many other indicators. A very simple example to explain the main idea of FTE is that if ten people work half-time, the FTE is then five people as number ten is the

typical head count for the organization. (Fitz-enz 2000, p. 44) Mathematically, the equation for calculating the number of FTE is presented below.

$$FTE = \frac{The\ amount\ of\ total\ working\ hours}{The\ amount\ of\ annual\ working\ hours}$$

Full-time equivalent consists of all full-time, part-time and contingent labour working hours to which income has been paid (Fitz-enz 2000, p. 45; Kesti 2017). In the target company, the effective number of personnel is already calculated as a part of monthly human capital report that represents changes in personnel in different cost centres. Effective number of employees is the total number of personnel, including summer employees and expats but excluding long time leaves and leased employees. Part-time workers are counted as half. Therefore, FTE can be measured by adding together effective number of personnel and the number of salaried leased employees.

In the example calculation, the effective number of salaried personnel is almost consistent with salaried full-time equivalent. This is due to the fact, that target company recruits very rarely salaried employees via rental companies. Part-time employees are calculated as half also in FTE regardless of the real amount of hours they have worked in reality. The difference to the outcome of FTE is very small and the target company chooses to utilize their existing calculations in their reporting. Appendix X also represents the total full-time equivalent and the relation of salaried FTEs and total FTEs in the target company. Many of the human capital productivity indicators include some financial figures that must adjusted in accordance with considering only undirect employees. This is accomplished by calculating the percentage of salaried FTEs of the total FTEs that include also direct employees. This practice is based on the target company's conception that each employee is equally participated to producing revenue and profit for the organization.

In many companies it is more typical to measure just the number of employees, but in several situations headcount itself does not give comprehensive picture about the status of available workforce. Generally, measuring full-time equivalent is more accurate figure to measure as it takes the actual number of working hours into consideration. However, even though FTE indicates the invested working hours, it requires other indicators to be able to evaluate human capital productivity more widely.

4.3.2 Effective working hours

Effective working hours is an indicator that refers to the time that employee spends on actual work. However, the calculations for it are starting from the concept of theoretical

working hours which mean the working hours in accordance with the agreed working time system. They include annual vacation days but do not count overtime hours or leaves that short working hours. Total working time is calculated by reducing absences due to vacation, sickness, parental leaves, trainings, travelling and other paid absences. (EK 2016) Kesti & Syväjärvi (2012) argue that despite the importance of measuring total working hours and the total capacity of human capital, it is not enough accurate indicator for human capital productivity purposes. This is because total working hours are not equivalent to the hours that employees spent for actual work. Kesti & Syväjärvi (2012) suggest that total working time can be divided in other working time (PAFF) and effective working time. This way the total human capital capacity can be seen as effective working time. Thus, completely accurate measurements are not possible to execute as employees themselves are the only ones who know the actual time consumed to work. In addition, an input which takes one hour of working time from one employee might take more or less from other employees. The distribution of working time is presented in Figure 6.

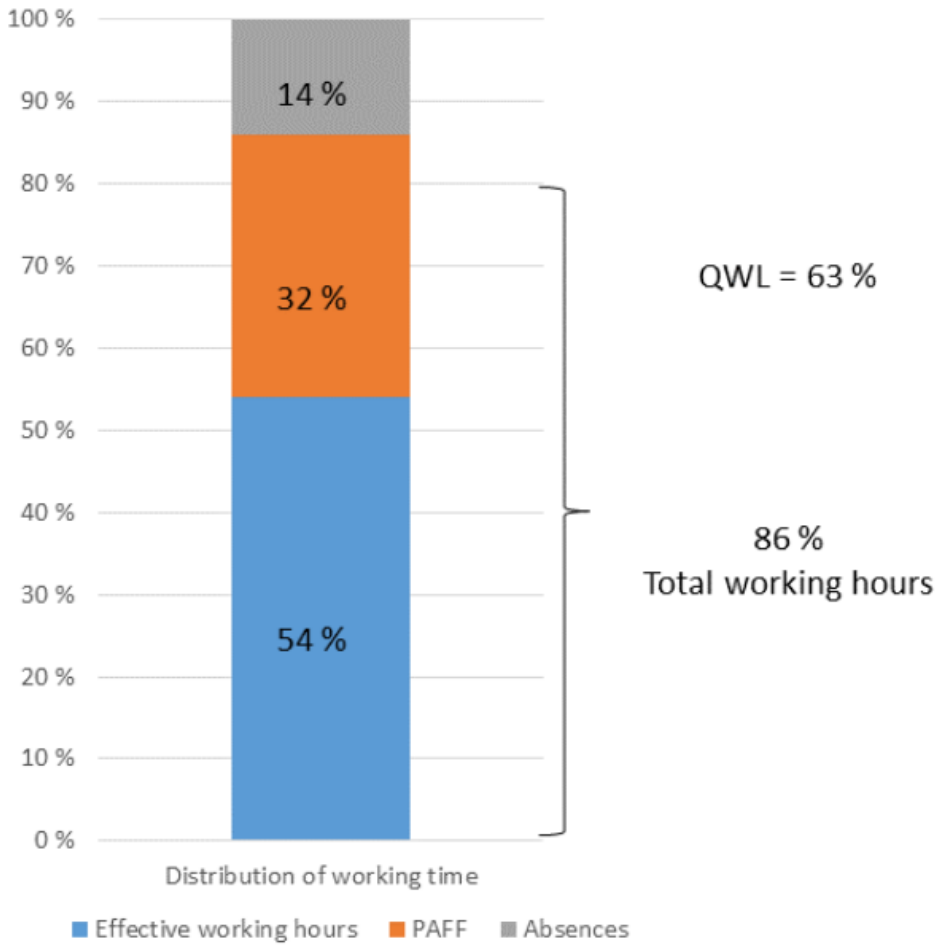


Figure 7. *Distribution of working time and effective working hours (retelling: Kesti 2012)*

In Figure 6, the distribution of working time is presented in a simple histogram. One hundred percent working time describes the theoretical working hours that include absences such as vacations, other absences, training, work guidance, self-development and other paid hours that employees do not spend on actual work. Total working hours are calculated by deducting absences from theoretical working hours. With the help of quality of working life, effective working hours and other working hours PAFF (stands for Preventive actions Appraisal, Internal Failure, External Failure) are also able to measure. If QWL is known, the equation for effective working hours is

$$Effective\ working\ hours = QWL * Total\ working\ hours$$

In this example, when quality of working life is 63 percent and total working hours 86 percent, the result for effective working hours is 54 percent. PAFF can be measured by deducting effective working hours from the total working hours percentage Kesti (2012).

As an indicator, effective working hours itself does not indicate the monetary value that human capital produces, it can be seen as useful metrics in order to follow the performance of employees. As it also considers quality of working life as a part of the measurement, it is a qualitative indicator about the effectiveness of employees. Effective working hours as a part of the monetary indicators can also show more realistic status about human capital productivity rather than comparing the output with full-time equivalents, which doesn't take the loss of working time for PAFF. Measuring effective working hours together with quality of working life, would also provide a possibility to follow their development in accordance with monetary value based human capital productivity indicators. For example, if quality of working life increases together with effective working hours, how it is shown in other indicators.

4.3.3 QWL

Quality of working life (QWL) is a concept that manages with the experienced overall quality in the organisation and with the well-being of the employees. It describes the fluency of work and well-being experienced by the employees and how the organization fulfils the individual needs related to working life. Quality of working life comprises the capabilities of the organization, including management, leadership, culture, competencies and processes of the company. By developing the quality of working life, business capacity will be increased, and outcome improved. (Kesti 2012)

According to the study executed by Kesti (2012), the profit centres in which the quality of working life is experienced as the best are also growing profitably. On the contrary, in profit centres in which the quality of working life is experienced as the worst has problems to maintain their profitability and growth. Kesti et al. (2016) also suggest, that in order to gain a comprehensive picture of organization's quality of working life, it should be defined with the help of three aspects which are PE (physical and emotional safety), CL (collaboration and identity) and OC (objectives and creativity). By using these facets, QWL can be calculated as follows.

$$QWL = PE * \left(\frac{CL + OC}{2}\right)$$

It should be noted that in the target company the quality of working life is measured with Human Potential Index Survey enquiry which does not take these three aspects into account exactly similarly as Kesti (2012) suggests. In his study, Kesti (2012) also represents a specific method for implementing the work satisfaction survey in a way that supports the calculation of quality of working life. On that score, the results cannot be considered as accurate as when utilizing PE, CL and OC in the measurements. In spite of the possible inaccuracy, quality of working life is an essential indicator relating to human capital productivity measurement that it should be calculated at any rate.

Considering measurement of human capital productivity, QWL itself does not indicate how much monetary value human capital can produce. However, measuring and following development of quality of working life can give valuable information indirectly about status of human capital productivity. The aspects of QWL can be also seen as a part of the concepts of human capital productivity such as ability of work and motivation. Additionally, Kesti (2012) states that the competencies of quality of working life determine the time division between effective working time and other working time.

4.3.4 Absenteeism

Absenteeism refers to absences due to sickness that include loss of working time due to employee's own sickness, inspection appointment, treatment appointment or rehabilitation (Kaukinen & Saukonen 2009; Manka & Hakala 2011). The normal operation of the company is to mitigate unnecessary costs and to ensure the well-being of employees. It is important to monitor and analyse sick leaves so that preventative actions can be planned and causes of the sick leaves affected and the number of leaves reduced. (Kaukinen & Saukkonen 2009) The sick leave % can be calculated as follows:

$$Sick\ leave\ \% = \frac{Sick\ leave\ hours}{Theoretical\ regular\ working\ hours}\ x\ 100\ \%$$

Sick leave percentage is therefore calculated by dividing sick leave hours with theoretical working hours. After that, the result is multiplied with 100 %. If necessary, absences due to sickness can also be calculated per employee. The formula is presented as below:

$$Sick\ leave\ days\ per\ employee = \frac{The\ number\ of\ sick\ leave\ days}{The\ number\ of employees}$$

Absences due to sickness are a huge cost for companies, insurance systems and to the whole society. In reality, costs due to absences are much higher for the companies as in addition to the direct costs there are plenty of indirect costs due to the recruitment of substitutes, loss of productivity and the changes on work atmosphere. (Kaukinen & Saukkonen 2009) Regarding measuring human capital productivity, sick leave % quite obviously does not measure productivity itself. However, measuring absences and sick leave is a good indicator to evaluate human capital productivity through its components. For instance, sick leave % has a clear linkage to ability to work, which is one of the areas impacting human capital productivity according to Aura et al. (2015, p. 5-6). Hereby, following development of sick leaves also enables management to assess the trend of human capital productivity concepts with the trend of money-based indicators.

4.3.5 HCPF

Human capital production function (HCPF) is an instrument for the companies to review their revenue through organizations human resources presented by Kesti & Syväjärvi (2015). HCPF provides explanatory methods and techniques for the management in support of strategic decisions and analyses. The equation for human capital production function is presented below

$$R = K * L * TTW * (1 - AW) * QWL$$

In the equation, R refers to produces revenue in a company. K stands for coefficient for effective working time revenue relation. K can be presented with value of Human resource business ratio (HRBR). L signifies the employee capacity in full-time equivalent. TTW refers to theoretical yearly working time in hours as AW refers auxiliary working time share of theoretical working time. AW includes absences such as vacation, sick leaves, training, parental leaves and so on. 1 – AW indicates time share that is available for actual work, that is to say, time spent at work. QWL stands for quality of working life.

HCPF is not an indicator to measure human capital productivity directly but rather to clear out the impacts of development of its different components. HCPF enables evaluating the efforts made by management to the produced revenue. Consequently, it is a tool to support strategic decision making and analysis (Kesti & Syväjärvi 2015). HCPF is a quite demanding indicator to use as it includes several figures to be calculated in order to be utilized.

4.4 Characteristics of indicators

In this chapter there are total of 12 indicators presented for human capital productivity measurement. Table 3 introduces a classification for different characteristics of indicators. There are divided into five main classes that are productivity, profitability, qualitative features, evaluating impacts of human resource decisions and supportive indicator. Each metric can have features from more than one classification, but in this division there is only one main classification chosen for every indicator.

Table 4. *Classification of the features and characteristics of indicators*

	Productivity	**Profitability**	**Qualitative features**	**Supportive indicator**
HCRF	x			
HCCF	x			
HEVA		x		
HCVA		x		
EBITDA		x		
HCROI		x		
HRCCR			x	
HRBR			x	
FTE				x
Effective working			x	x

hours, QWL				
Absentee-ism				x
HCPF				x

In this classification, productivity refers to those indicators that are purely measuring productivity based on the definition by Uusi-Rauva (1997, p. 19), where productivity is seen as the relation of output and input. Profitability indicators are being seen as human capital productivity indicators that are actually measuring profitability and are mostly based on financial profitability figures. Qualitative indicators refer to those indicators that utilize qualitative factors as a part of them. In this case, quality of working life is the qualitative factor in all these indicators as it is based on employee satisfaction survey and it is also measured as a part of effective working hours. Supportive indicators refer to those indicators that do not directly measure human capital productivity, but they are important part of other indicators or they are measuring the aspects affecting human capital productivity. Evaluating the impacts of human resources-based decisions is actually suitable classification for every indicator. In order to measure human capital productivity comprehensively, metrics should cover all different classifications presented in Table 3. The results for this study are also being evaluated referring to this classification. Additionally, all of the presented indicators can be used when evaluating the effects of human capital based decisions made by the management. As this covers with all metrics, it was decided to be left out from the classification.

5. RESULTS

5.1 Category questions

5.1.1 Response rate

The questionnaire was sent to employees working in two departments in the target company from which 13 are working in Human Resources and 10 are working in Finance department. This makes the total sample for the questionnaire 23. Since this study utilizes non-probability purposive sampling, ineligible and unreachable respondents do not need to take into consideration. Therefore, total response can be reviewed without them. Total response rate for the questionnaire is calculated below.

$$Total\ response\ rate = \frac{6}{23}\ x\ 100\ \% = 26{,}1\ \%$$

Total response rate is calculated by dividing the total number of responses with the total number in sample. After this, the result is multiplied with hundred which gives the response rate for this questionnaire 26,1 percent when rounding up to 1 decimal. All the received responses in this questionnaire were usable. In addition, since current contact information for the respondents was given by the target company, there were no unreachable respondents nor hard-bounce e-mail addresses. However, according to Saunders et al. (2015, p. 284), in academic studies the typical response rates starting from 35 percent are reasonable. Comparing to this reference value, 26,1 percent is considered rather low. Two e-mails were sent to remind to response in order to increase response rate. Despite this the total response rate remained rather low.

5.1.2 Frequency distributions

This chapter presents the different frequency distributions. Frequency distributions are implemented for the two category questions in the questionnaire which consider department and role of the respondents. The distribution for recipients that the questionnaire was sent based on the department is presented in Table 5 and Figure 8.

Table 5. *Distribution of recipients based on department*

Department	Frequency	%
Human Resources	13	56,52
Finance	10	43,48
Total	23	100,00

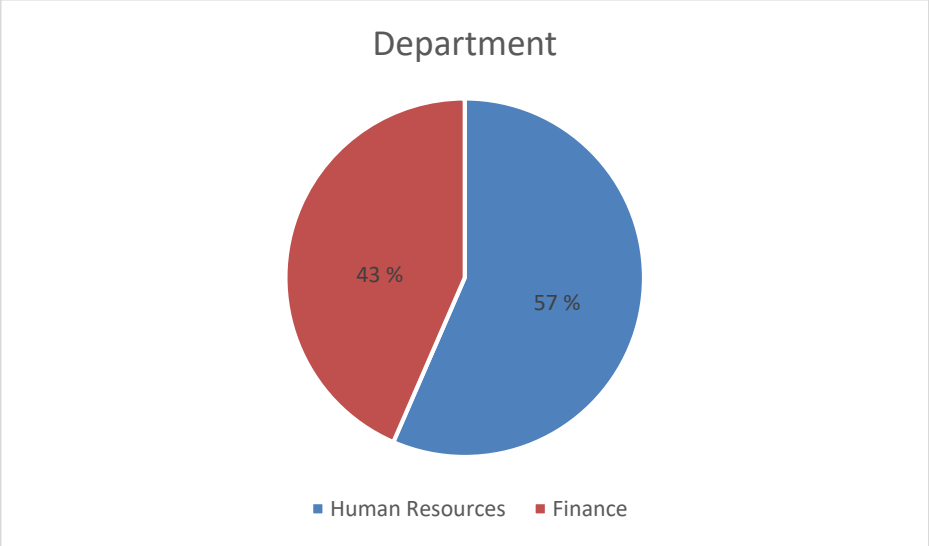


Figure 8. *Distribution of recipients based on department*

Departments of the recipients in the sample were given by the target company in connection with the recipient list. As table 5 and Figure 8 both show, the distribution of respondents based on department is rather equable. Human Resources represent light majority with a percentage of 56,52 of the total respondents. Although in the questionnaire the role of the respondent is asked, the title was not known beforehand.

Table 6. *Distribution of response rate by department*

Department	Recipient frequency	Responses frequency	Response % by department
Human Resources	13	4	30,77
Finance	10	2	20,00
Total	23	6	26,10

Table 6 presents the distribution of response rate by department. When comparing response frequency with recipient frequency, it shows that response % of Human Resources is 30,77 whereas in Finance it is 20,00. This makes response % a little over 10 percentage points higher in Human Resources.

Table 7. *Distribution of respondents by department*

Department	**Frequency**	**%**
Human Resources	4	66,67
Finance	2	33,33
Total	6	100,00

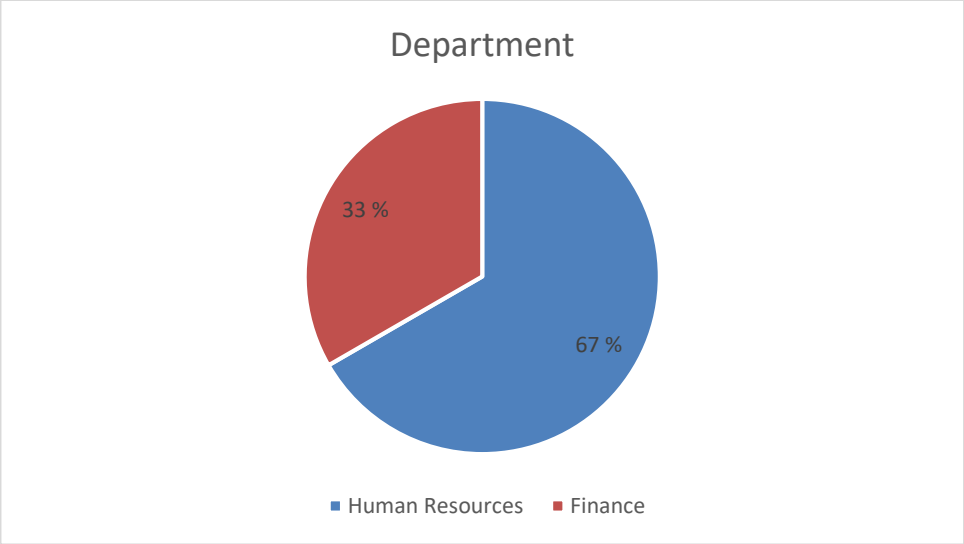


Figure 9. *Distribution of respondents based on department*

Table 7 and Figure 9 present the distribution of respondents by department. Human Resources play the majority part of the respondents with 66,67 percent of total respondents. However, as total number of responses is quite small, it must be noticed that the actual difference in frequencies between Human Resources and Finance is only two units.

Table 8. *Distribution of respondents by role*

Role	Frequency	%
Manager or Director	3	50
Specialist, Assistant or similar	3	50
Total	6	100,00

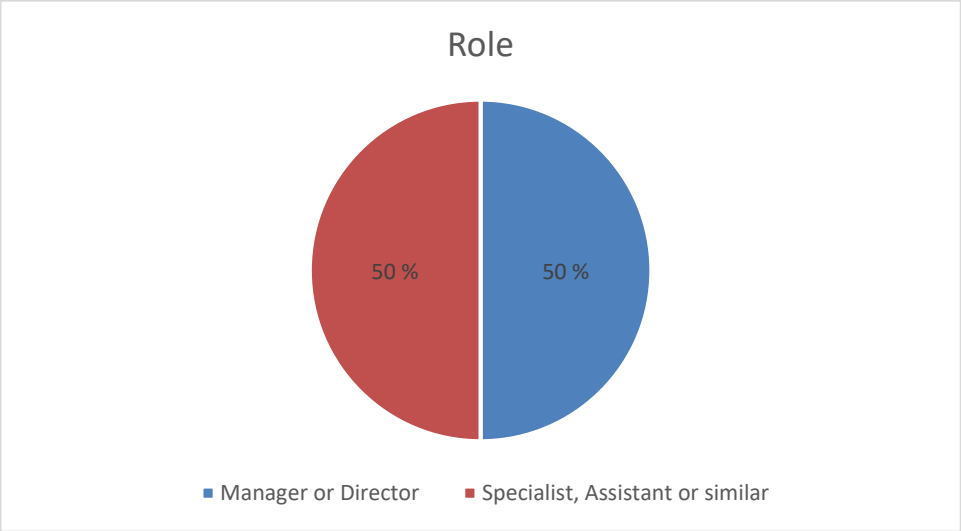


Figure 10. *Distribution of respondents based on role*

Table 8 and Figure 10 show the distribution of respondents by role. As it can be seen in both presentations, roles of respondents are distributing equally. Both categories present the same frequency in the questionnaire. However, as presented in the case of departments, rather low response rate must be taken into consideration when assessing the distribution of respondents based on role.

5.2 Indicators

This chapter presents the chosen indicator based on the implemented questionnaire. In the questionnaire, each respondent was asked to choose from four to five indicators that they believe are the most suitable for the measurements. The indicators that will get most occurrences based on the data collection from the questionnaire, would be the provided set of metrics for the target company to be able to measure human capital productivity comprehensively.

Table 9. *Distribution of indicators*

Indicator	**Frequency**	**%**
HCRF	3	11,54
HEVA	1	3,85
HCCF	3	11,54
HCVA	0	0,00
EBITDA	3	11,54
HCROI	4	15,38
HRCCR	3	11,54
HRBR	2	7,69
HCPF	1	3,85
FTE	1	3,85
Effective working hours	1	3,85
Absenteeism	4	15,38
Total	26	100,00

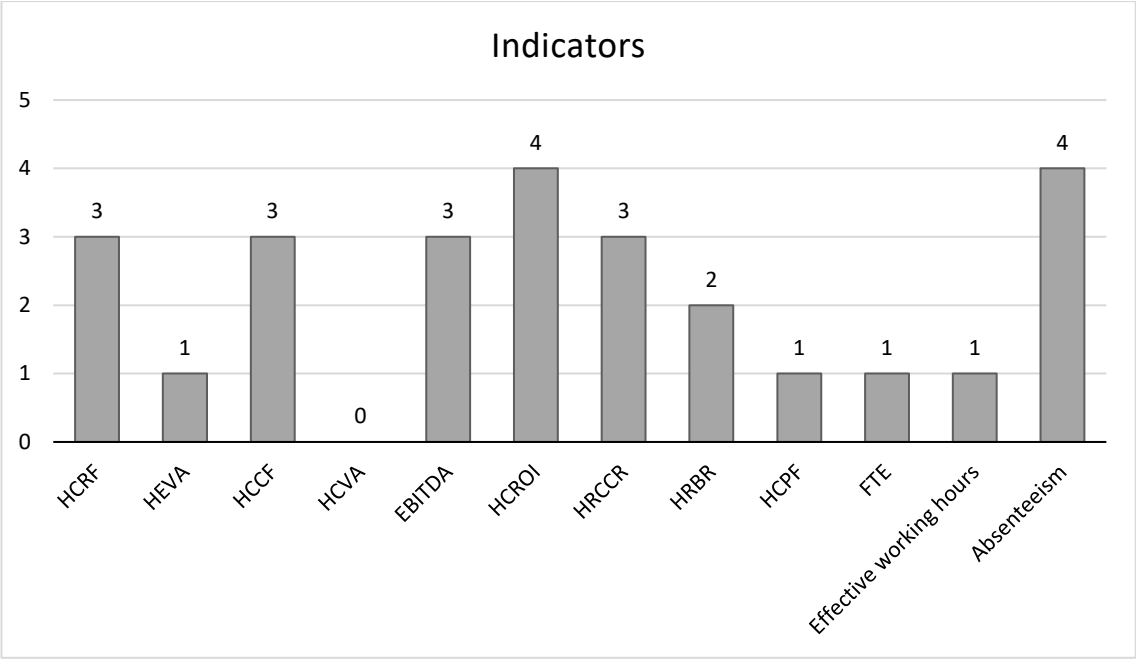


Figure 11. *Occurrence of each indicator*

Table 9 presents the distribution of each human capital measurement indicator. The occurrence of each option based on collected data is can be seen in the frequency column in the table. Also, the percentage of the total occurrences is given in the table. The distribution of indicators is also presented more visually in Figure 11.

Table 10. *Cross-tabulation of indicators compared to department of respondents*

Indicator	Finance	Human Resources	Total
HCRF	1	2	3
HEVA	0	1	1
HCCF	1	2	3
EBITDA	1	2	3
HCROI	1	3	4
HCVA	0	0	0
HRCCR	1	2	3
HRBR	1	1	2

HCPF	0	1	1
FTE	1	0	1
Effective working hours	0	1	1
Absenteeism	1	3	4

Table 10 presents the distribution of indicators' occurrences based on the department of a respondent. Comparison has been implemented with help of cross-tabulation. However, as it can be seen in Table 10, the occurrences of indicators made by finance department have been distributed so that any of the indicators haven't got more than one hit. This has been affected strongly by the low number of respondents from the finance department. So, even though cross-tabulation of the occurrences between departments shows that human resources present the majority in almost all cases, the result must be discovered with consideration. FTE presents the only indicator in which finance has more occurrences than human resources. Despite human resources have more respondent, they have a little more unanimousness in their answers than finance department.

As it can be seen from Table 9 and Figure 11, generally the occurrences of the indicators are rather equable. The range of occurrences is [0, 4] and the average value for frequency is 2,17. The highest percentage portion of all frequencies is 15,83. However, as total occurrences gained from the questionnaire is 26, originating of dispersion is naturally much less likely than with higher number of respondents and data.

Table 9 and Figure 11 show that two of the indicators, HCROI and absenteeism get most hits with 4 occurs each. In total four different indicators (HCRF, HCCF, EBITDA and HRCCR) have occurrence of 3. Occurrence of other indicators is 2 or less. However, only one indicator, HCVA, has been left out and without any occurrence. Consequently, HCROI and absenteeism are directly chosen for the group of indicators for the measurements with their highest occurrences. However, after that, selection of the rest of the metrics takes more consideration. This is because after the highest points there are in total four indicators with occurrences of three. These metrics are HCRF, HCCF, EBITDA and HRCCR.

In order to measure human capital productivity comprehensively, the set of metrics should cover all the classifications related to the indicators. That is why there is no reason for balloting the rest of the indicators that received the same number of occurrences.

This classification is presented in theory part of this study. Classifications are productivity, profitability, qualitative features, supportive indicator and evaluative indicators. However, evaluative indicators can be left out as all the indicators can be considered to be used in order to evaluate human-based decisions in organizations. According to the classification, HCROI is a categorized as a profitability indicator and absenteeism as supportive indicator. This leaves qualitative features, productivity and evaluating the effects of human-based decisions indicators left to be covered. HRCCR is considered as the only indicator consisting qualitative features, so it included in final results. HCRF is chosen because it presents the productivity measurement as its purest, though HCCF is classified as productivity metrics as well. Total number of selected indicators was chosen to remain four as the two possibilities of the classifications of indicators left to be chosen were already presented. All the chosen indicators are presented in Table X with their classification and number of occurrences.

Table 11. *Selected indicators*

Indicator	**Classification**	**Occurence**
HCRF	Productivity	3
HCROI	Profitability	4
HRCCR	Qualitative	3
Absenteeism	Supportive indicators	4

5.3 Open questions

In the questionnaire there were also open questions in order to allow respondents to justify their choices for indicators. An open question was provided related to every indicator that was presented. However, only one respondent provided information utilizing open questions.

Simplicity was emphasized as a key factor in two indicators in the open questions. Additionally, to be able to use already existing metrics from human resource and financial reports was considered an important thing. Some metrics were also considered valuable for the managers and management to understand and follow.

In addition to the justifications for the choices, open questions were also used in order to provide other comments for the indicators that were not selected. For instance, it was stated that some of the metrics are too complex to be track on and some use figures that are not followed frequently enough. There were also some questions related to indicators. For example, the difference between HCVA and EBITDA was questioned as well as the calculation principles for the PAFF, considering quality of working life. The questions related to functioning of each indicator were provided regardless of request to send them to the researcher.

5.4 Summary of results

Results for this research provide a set of indicators to measure human capital productivity. The selected metrics in the target company are HCROI, HCRF, HRCCR and absenteeism. When comparing to the classification in the theory part of the study, the results present extensively different divisions of human capital productivity indicators.

However, as it was already mentioned as a part of presenting the results, the response rate (26,1 %) for the study was rather small. Low response rate clearly has an impact for the validity of the results. The results cannot be assumed to present the opinion of entire population comprehensively.

Also, requesting respondents to choose four or five indicators gives the results some vagueness. This also gives more importance for those respondents' answers' who chose five indicators instead of four. As it where, they had two votes instead of one. However, each respondent had the possibility to choose five indicators. Nonetheless, instructing to choose only four or five indicators could have provided even more accurate results.

Additionally, open questions related to the questionnaire were largely unused in the questionnaire by respondents. Actually, only one respondent was using open questions to amplify his or her answers. However, making open questions mandatory for answering would have probably given only empty or "*I don't know*" type of answers. These would have not given any more value to the results anyhow.

6. DISCUSSION

6.1 Research questions and empirics towards literature

A set of metrics based on the implemented questionnaire for human capital productivity are HCROI, absences, HCRF, HRCCR and absenteeism. As it can be noted from the table X, these metrics measure human capital productivity rather comprehensively based on the classification defined in the theory part of this study. However, as some of the indicators received the same number of occurrences, the result could have slightly differ if the rest of the metrics would have been balloted instead of ordered. It was considered preferable to provide the target company the best set of metrics possible based on their answers. To conclude, generally the results gained from this study are measuring human capital productivity comprehensively.

Table 12. *Selected indicators with the classifications*

	Productiv-ity	**Profitability**	**Qualitative features**	**Supportive indicator**
HCRF	x			
HCROI		x		
HRCCR			x	
Absentee-ism				x

As a result, this research provides a set of indicators for the target company to be able to measure their human capital productivity comprehensively. However, the indicators themselves yet do not bring any value to the company. The value provided by them can be discovered after they have been used to evaluate the effects of the decisions. That is why the support and guiding from the management to promote the usage of them can be considered as a vital factor. Also, taking some new metrics into use will always bring some extra work to the team. Currently at the target company creating reports usually considers a lot of manual work, which is also the case with these metrics. Consequently, taking metrics as a part of the monthly reporting from the start would integrate them to be used like other indicators from the beginning.

The intention of this research was to focus on the human capital productivity measurements of undirect employees only. However, in this case, this limitation can be considered rather unnecessary and the metrics could also be applied to the whole workforce. This is because of the target company's desire to concentrate on the financial-based indicators as well as the utilized definition of human capital productivity by Kesti (2010). Especially with monetary-value indicators, the separation of direct and undirect employees is not relevant. Financial figures can obviously be proportioned according to the relative share of the salaried employees, but this does not make a real difference between direct and undirect workforce. Anyhow, tracking metrics such as effective working hours with quality of working life enable more effectively reviewing the productivity of only salaried personnel.

The sample for the data collection in this study is relatively small. However, it was considered preferable to target the questionnaire to only those employees who already have education, understanding and know-how about the concepts of this research. This was conceived as an important factor in order to gain as actual results as possible for the selected indicators. However, with more respondents the results would have presented the conceptions of both departments more widely. Now only quite a small portion of the employees and their notions reflect the opinions of the total sample, in other words employees working in human resources and finance departments.

In addition to the rather small number of respondents, it is also uncertain how well they have actually understood the functioning and differences between different indicators. This will certainly also have an impact on the results received from the questionnaire. There were short explanations related to every indicator in the questionnaire, but more specific questions were asked to send directly to the researcher if needed. However, regardless of the instructions there were some focusable questions presented in connection with open questions in the questionnaire. Considering this, for example group interviews could have provided a better situation to explain the functioning of the indicators. Thus, interviews were proposed to take too much time to organize with both departments.

However, even though the purpose of this thesis was to find suitable indicators to the target company, this does not itself guarantee the applicability to the organization. Selected indicators surely provide a comprehensive basis for human capital productivity measurement, but in order to gain the most advantage of them, other factors could also be taken into consideration. For example, to be able to truly implement the metrics into monthly use, the availability of figures needed for the indicators could be relevant to be observed. Currently in the target company, the monthly reporting in human resources

and finance departments is done largely manually by combining figures from various information systems into Excel. Due to this, it must be noted that before implementing some automations to develop reporting, introducing do manual work to be track on can cause some resistance to change especially without the support from management team.

According to Kujansivu et al. (2007, p. 164), measuring intellectual capital is challenging due to its intangible nature. Additionally, there are multiple ways to measure it. This research focuses on presenting monetary-value indicators with some non-financial figures which also present only a portion of all the metrics available. In this research, human capital productivity refers to the return on investment made on employees (Kesti 2010). However, as there is no unambiguous definition to view human capital and its productivity. Due to this, how human capital productivity is considered, processed and defined have had a strong influence on the presented indicators in this study.

Kesti (2010) states that human-centred productivity development should be implemented by improving the quality of working life and with utilizing electric development tools. He also notes that development of human capital productivity means improving the competitiveness of the company by enhancing the comprehensive analysis and development of human capital. Due to this, just implementing a suitable metrics should not be the only action for effective human capital management. Indicators should act as tools for evaluating the impacts of human-based decisions in the organization.

7. SUMMARY AND CONCLUSIONS

7.1 Summary of the research

Human capital as a phenomenon is not new at all. The term human capital refers to the assets owned by the employees such as education, knowledge, characteristics and other competencies. The importance of human capital for companies and organizations has been recognized already for longer time. It is considered as a primary component when improving business performance, productivity and gaining competitive advantage. However, managing human capital is often disregarded by the companies due to lack of understanding of the concepts of it.

Productivity is a general concept for reviewing the relation of outputs and inputs invested to achieve them. The improvement of productivity is also the foundation for wealth creation in companies. Nevertheless, productivity of undirect employees is challenging and there is no unambiguous indicator for measuring it. In this research, human capital productivity refers to the return on investment made on employees. Based on this definition and the need from the target company, this study is focusing on processing mainly human capital indicators that are monetary value metrics. Additionally, they are supported with some non-financial figures that evaluate human capital productivity through its characteristics.

The purpose of this research was to examine how to measure human capital productivity comprehensively in the target company. Different kind of indicators were surveyed, evaluated and classified based on their characteristics and purposes of usage. There were four categories found to classify the features of the indicators. These categories are productivity, profitability, qualitative features and supportive indicators. After the categorization, the purpose was to test how well this is actualized in the target company based on the implemented questionnaire.

As a result, this research presents four different indicators for the human capital productivity measurements. These indicators are HCRF, HCROI, HRCCR and Absenteeism. Generally, it can be stated that based on the classification presented in this study, these metrics measure human capital productivity extensively as they cover each category that is defined. It can be said that comprehensively is realized in the case of the target company.

During the research it was discovered that human capital productivity is rather complicated phenomenon and that there is no single nor unanimous way to measure it. However, to be able to manage and improve the status of employees better, it is recommendable to measure human capital as a part of other intellectual assets. When reviewing the results gained from this study, it must be considered that the results are based on the opinions of the respondents. They are affected by their personal views, experiences, knowledge and education. Consequently, it would be engrossing to implement the research for more companies for example in the same industry. In the future it would be absorbing to research how the human-based decisions will be reflected in the set of metrics.

7.2 Limitations

According to Saunders et al. (2015, p. 642), practically all research has some limitations. These limitations should still not be considered as weaknesses, but rather as a mature reflection regarding the study. In this research, insularity of research material must be considered as limitation for the study. This research presents only a very small part of human capital productivity metrics compared to all existing indicators in the studies. This is mainly due to the decision to focus mainly on monetary-based indicators in this research. However, as research problem is to solve how to measure human capital productivity comprehensively, it is notable to be aware that this study does not take all possible indicators into consideration.

Saunders et al. (2015, p. 151) note that research philosophy influences all the aspects of the research projects. Consequently, research philosophy can also act as a certain limitation for this study. Research philosophy for this study is pragmatism which also has an impact on other methodological choices in this study that will set some limitations for research in general. For instance, research philosophy has affected to selected research method, strategy and data collection techniques that have influenced the results and the whole implementation of the study.

Due to the limitations related to this study, the generalization of research results must also be evaluated critically. However, as the research strategy for this research is a case study, the results quite naturally are also company-specific. If the questionnaire was implemented for another organization, results would most probably differ from the results in this study. Even if the questionnaire was implemented second time in the case company, could it lead to different results for instance due to possible changes in the number of respondents and their experiences regarding indicators. Still, in both cases, the study itself can be repeated.

7.3 Future research

Since human capital is recognized as the most important asset in the organizations (Boudreau 1999; Fitz-ens 2000, p.1; Betchel 2007; Kesti & Syväjärvi 2015), future research for it is needed not only in the target company but also in every evolving institute. In the target company, it would be interesting to be able to monitor the actual usage of the chosen metrics in the future. As indicators will reflect the impacts of implemented human capital decisions made by management, they will also provide insightful and visible information for them. For instance, it would be interesting to discover if the investments made on a new well-being program will subsequently lead into a reduced absences and human capital costs and eventually into increased return on investment.

Alongside with following the impacts of decisions, following them in more detail would provide compelling information about the status of human capital. For instance, in the target company there could be an opening to monitor the metrics on department or even team level. Possible differences between departments would give management knowledge about what parts of the company need more focus and attention. Although, especially team-specific measurements would require quite significantly more resources to be track on.

REFENCES

Aura, O., Ahonen, G. & Hussi, T. (2015). Henkilöstötuottavuus ja eurot – case rakennusala. [PDF] Helsinki. Keskinäinen Eläkevakuutusyhtiö Etera. Available: www.etera.fi/henkilostotuottavuus

Baron, A. & Armstrong, M. 2007. Human Capital Management: Achieving Added Value Through People. Kogan Page, London. 238p.

Betchel, R. (2007). Calculating Human Capital: The Market Based Valuation of the Human Resource. German Journal of Human Resource Research 21, 3. pp. 206-231.

Berzkalne, I. & Zelgalve, E. (2013). Intellectual Capital and Company Value. Procedia – Social and Behavioral Sciences 110. pp. 887-896.

Bontis, N. & Fitz-enz, J. 2002. Intellectual capital ROI: A Causal Map of Human Capital Antecedents and Consequents. Journal of Intellectual Capital 3, 3. pp. 223-247.

Bosch-Sijtsema, P.M., Ruohomäki, V. & Vartiainen. M. (2009).
Knowledge work productivity in distributed teams. Journal of Knowledge Management 13, 6. pp. 533-546.

Boudreau, J.W. (1999). Strategic Human Resource Management Measures: Key Linkages and the PeopleVantage Model. Journal of Human Resource Costing and Accounting 3, 2. pp. 21-40.

Brooking, A. (1996). Intellectual Capital – Core Asset for the Third Millennium Enterprise. 204 p. International Thomson Business Press. London.

Chang, W-J. & Huang, T. (2005). Relationship Between Strategic Human Resource Management and Firm Performance: A Contingency Perspective. International Journal of Manpower 26, 5. pp. 434-449.

Crook, T.R., Todd, S.Y, Combs, J.G. & Ketchen, D.J. (2011). Does Human Capital Matter? A Meta-Analysis of the Relationship Between Human Capital and Firm Performance. Journal of Applier Psychology 96, 3. pp. 443-456

Drábek, J., Lorincová, S. & Javorcíková, J. (2017). Investing in Human Capital as a Key Factor for the Development of Enterprises. Issues of Human Resource Management. IntechOpen.

Díaz-Fernández, M.C., González-Rodríguez, M.R. & Simonetti, B. 2015. Top management team's intellectual capital and firm performance. European Management Journal 33. pp. 322-331.

EK. (2016). Työaikakatsaus: Työajat ja poissaolot EK:n jäsenyrityksissä vuonna 2014 [PDF]. Elinkeinoelämän keskusliitto. Available: https://ek.fi/wp-content/uploads/Tyoaikakatsaus-2014.pdf. Opened 8.10.2018

Fitz-enz, J. (2000). The ROI of Human Capital: Measuring the economic value of employee performance. Amacom, United States. 299 p.

Google. (2019). Collect and organize information big & small with Google Forms. For free [WWW]. Google. Available: https://www.google.com/forms/about/ Opened: 4.3.2019

Hayton, J.C. (2004). Strategic Human Capital Management in SMEs: An Empirical Study of Entrepreneurial Performance. Human Resource Management 42, 4. pp. 375-391.

Hirsjärvi, S., Remes, P. & Sajavaara, P. (2007). Tutki ja kirjoita. 13. painos, Helsinki, Kustannusosakeyhtö Tammi, 448 p.

Iveta, G. 2012. Human Resource Key Performance Indicators. Journal of Competitiveness 4, 1. pp. 117-128.

Kalkan, A., Bozkurt, Ö. C. & Arman, M. 2014. The impacts of intellectual capital, innovation and organizational strategy on firm performance. Procedia – Social and Behavioral Sciences 150. Pp- 700-707.

Kannan, G. & Aulbur, W.G. (2004). Intellectual Capital: Measurement Effectiveness. Journal of Intellectual Capital 5, 3. pp. 389-413.

Kaukinen, K. & Saukkonen, S. (2009). Sairauspoissaolojen hallinta – Työkykyä ja työhyvinvointia. Elinkeinoelämän keskusliitto.

Kesti, M. (2010). Strateginen henkilöstötuottavuuden johtaminen. Talentum, Helsinki. 263 p.

Kesti, M. (2012). Organization Human Resource Development Connection to Business Performance. Procedia Economics and Finance 2. pp. 257-264.

Kesti, M. (2013). Human Capital Production Function. GSTF International Journal on Business Review 3, 1.

Kesti, M. (2017). Strategisen henkilöstötuottavuuden johtaminen [PDF].

Kesti, M. & Syväjärvi, A. (2012). Human Resource Development Function to both Organizational Performance and Quality of Working Life. GSTF International Journal on Business Review.

Kesti, M. & Syväjärvi, A. (2015). Human Capital Production Function in Strategic Management. Technology and Investment 6. pp. 12-21.

Kesti, M., Leinonen, J. & Syväjärvi, A. (2016). A Multidisciplinary Critical Approach to Measure and Analyze Human Capital Productivity. In Russ, M. Quantitative Multidisciplinary Approaches in Human capital and Asset Management. Hershey, PA: IGI Global. pp.1-22. p. 317

Kujansivu, P., Lönnqvist, A., Jääskeläinen, A. & Sillanpää, V. (2007). Liiketoiminnan aineettomat menestystekijät. Talentum, Helsinki. 1st Edition. 204 p.

Liu, X., van Jaarsveld, D., Batt, R. & Frost, A.C. (2014). The Influence of Capital Structure on Strategic Human Capital: Evidence From U.S. and Canadian Firms. Journal of Management 40, 2. pp. 422-448.

Lönnqvist, A., Kujansivu, P. & Antola, J. (2005). Aineettoman pääoman johtaminen. JTO-Palvelut Oy. Tampere. 252p.

Lönnqvist, A. (2007). Intellectual Capital and Productivity: Identification and the Measurement of the Relationship at Company-level. The Research Institute of the Finnish Economy. Discussion papers No. 1108.

Manka, M-L. & Hakala, L. (2011). Henkilöstötunnusluvut johtamisen tukena: Tukea tuottavuuden ja työyhteisön hyvinvoinnin kehittämiseen. Tutkimus- ja koulutuskeskus Synergos, Tampereen yliopisto.

Nathanson, P. (2005). Putting Strategic in Human Capital Management. Public Manager 34, 3. pp. 42-28.

Olkkonen, T. (1994). Johdatus teollisuustalouden tutkimustyöhön. 2. painos. Espoo, Teknillinen korkeakoulu. Raportti 152/1993/Teta. 143 p.

Saunders, M., Lewis, P. & Thornhill, A. 2016. Research Methods for Business Students: Seventh edition. Pearson Education. England, 741 p.

Stewart, T.A. (1997). Intellectual Capital. Nicholas Brealey Publishing, London. 2nd edition. 278p.

Tashakkori, A. & Teddlie, C. (2003). Handbook of mixed methods in social & behavioural research. Thousand Oaks. California.

Uusi-Rauva, Erkki. (1997). Tuottavuus – mittaa ja menesty. 296 p. Helsinki. 2. painos. Kauppakaari Oy.

Weresa, A.M. (2014). Innovation, Human Capital and Trade Competitiveness. Springer. 486 p. Switzerland.

Williams, C. (2007). Research Methods. Journal of Business & Economic Research 5, 3. pp. 65-72.

Yin, R.K. (2013). Validity and generalization in future case study evaluations. Evaluation 19, 3. pp. 321-333.

APPENDIX A: QUESTIONNAIRE

Human Capital Productivity

The purpose of this questionnaire is to review the different indicators for human capital productivity of salaried employees.

The questionnaire includes two parts. At first part there are two demographic questions about the department and role of the respondent. In the second part, there are total of 12 indicators presented with some measurements that use real data.

Please choose 4-5 indicators by clicking the tick box "Choose this indicator", that you think are the best to measure human capital productivity. Also provide a short reasoning for the indicators you choose. You can write it under the tick box. Other indicators can be left as empty.

After you are finished, just click "Send" button at the end of the form.

Thank you!

My department is

- ◯ Human Resources
- ◯ Finance

I work as

- ◯ Manager or Director
- ◯ Specialist, Assistant or similar

SEURAAVA

Älä koskaan lähetä salasanaa Google Formsin kautta.

Human Capital Productivity

Indicators

Please choose 4-5 indicators by clicking the tick box "Choose this indicator", that you think are the best to measure human capital productivity. Also provide a short reasoning for the indicators you choose. You can write it under the tick box. Other indicators can be left as empty.

After you are finished, just click "Send" button at the end of the form.

Thank you!

1. HCRF (Human Capital Revenue Factor)

HCRF = Revenue / FTEs.

Shows produced monthly revenue per full-time equivalent

HCRF

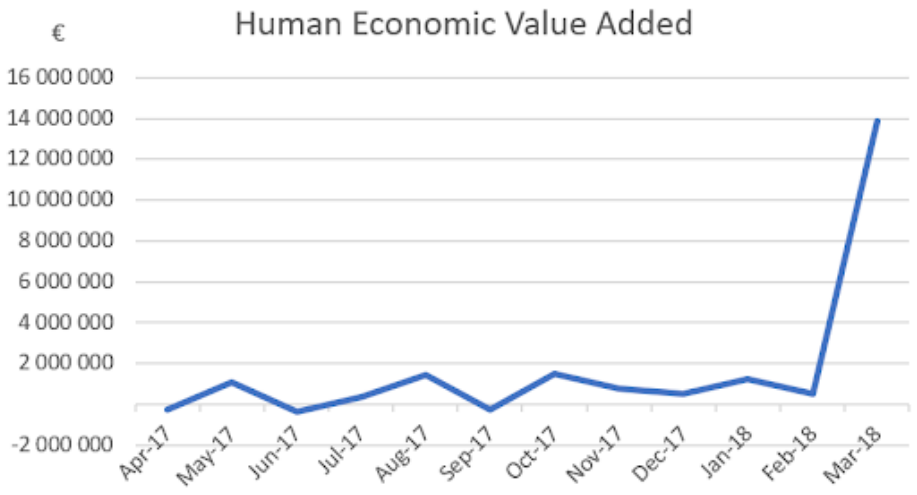
☐ Choose this indicator

Oma vastauksesi

2. HEVA (Human Economic Value Added)

HEVA = Net operating profit after tax - (Cost of Capital / FTEs)

Shows the amount of profit after all expenses and invested capital per full-time equivalent



HEVA

☐ Choose this indicator

Oma vastauksesi

3. HCCF (Human Capital Cost Factor)

HCCF = Pay + Benefits + Contigents + Absences + Turnover

Shows costs of human capital per full-time equivalent per month

Successful HR development reduces HCCF figure.

HCCF

☐ Choose this indicator

Oma vastauksesi

4. HCVA (Human Capital Value Added)

HCVA = (Revenue - (Expenses - Pay and Benefits)) / FTEs

Sorts out the profitability of average employee.

Shows the overall impact of employee development on human capital productivity

HCVA

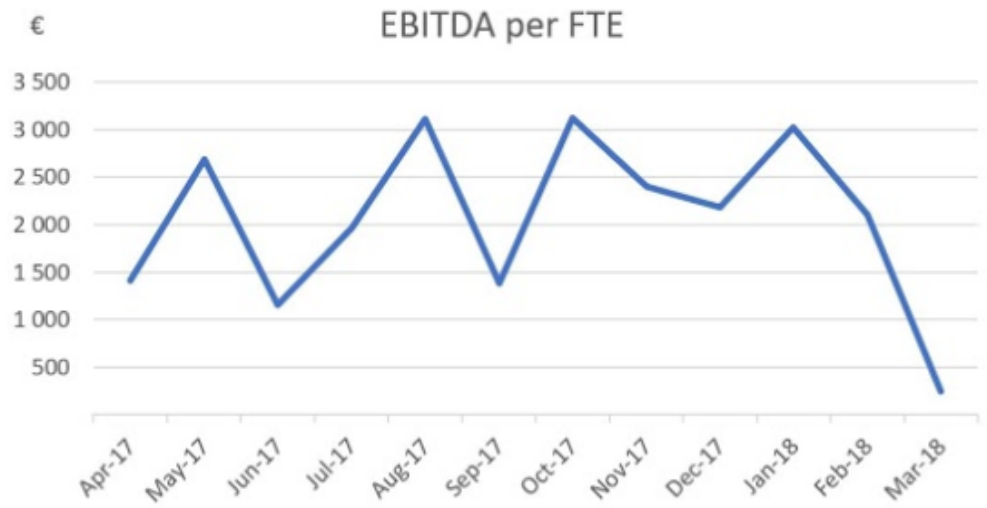
☐ Choose this indicator

Oma vastauksesi

5. EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization)

EBITDA = Turnover - Variable Costs - Human Capital Costs - Other Fixed Costs

States how much gross margin per full-time equivalent is produced monthly



EBITDA

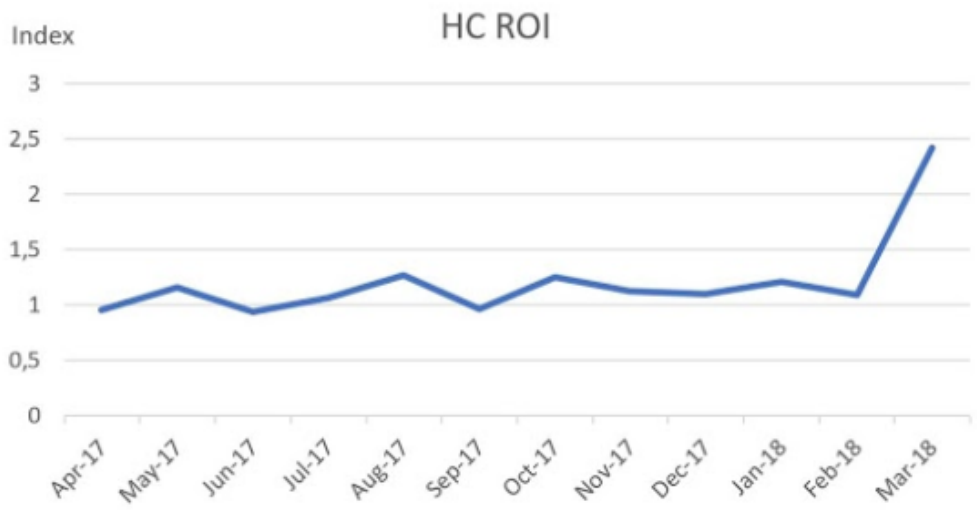
☐ Choose this indicator

Oma vastauksesi

6. HCROI (Human Capital Return on Investment)

HCROI = (Revenue -(Expenses - Pay and Benefits)) / Pay and Benefits

Shows the amount of profit derived for every euro that has been invested in human capital



HCROI

☐ Choose this indicator

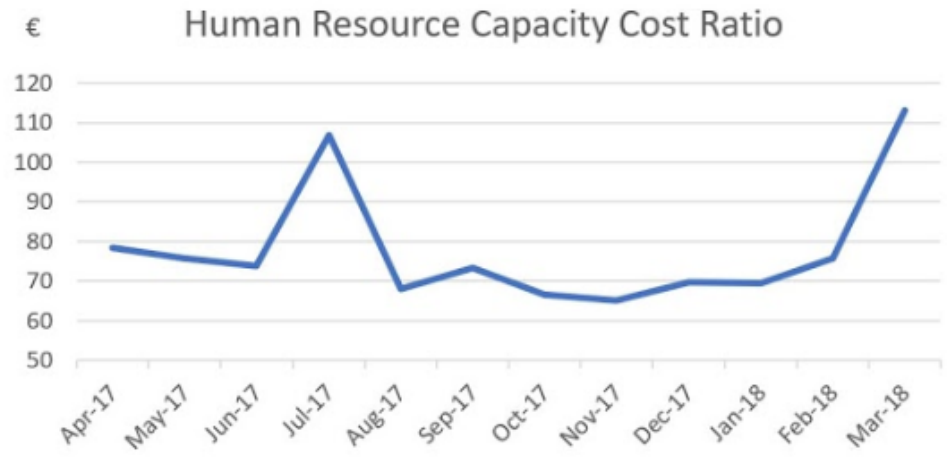
Oma vastauksesi

7. HRCCR (Human Resource Capacity Cost Ratio)

HRCCR = Human Capital Costs / Effective Working Hours

Shows how much human capital costs is consumed in one effective working hour.

It is a qualitative indicator as it takes effective working hours into consideration.



HRCCR

☐ Choose this indicator

Oma vastauksesi

8. HRBR (Human Resource Business Ratio)

HRBR = Revenue / Effective Working Hours

Shows how much revenue is made in one effective working hour.

Qualitative indicator as it takes effective working hours into consideration.

HRBR

☐ Choose this indicator

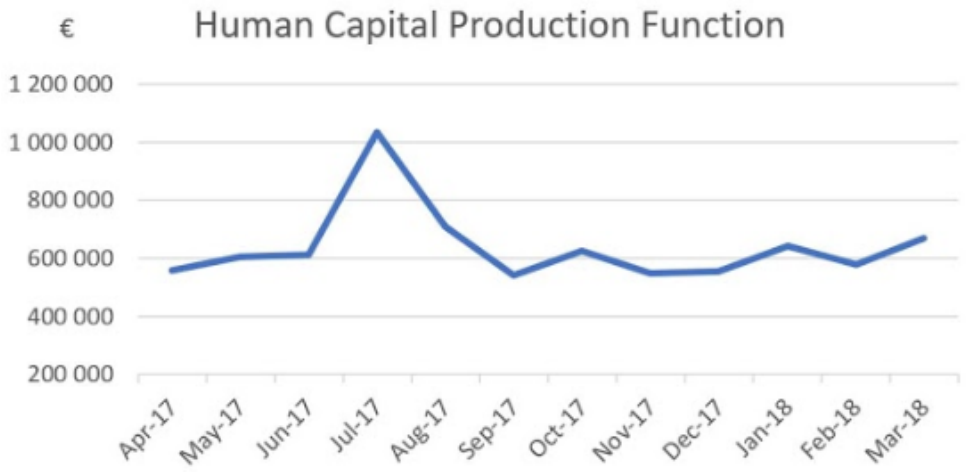
Oma vastauksesi

9. HCPF (Human Capital Production Function)

R = HRBR * FTE * TTW * (1 - AW) * QWL, where

R = revenue, FTE = Full-time equivalent, TTW = Theoretical yearly working time, AW = Actual working time, QWL = Quality of working life (based on the employee satisfaction surveys)

Enables to analyse the revenue produced by human capital



HCPF

☐ Choose this indicator

Oma vastauksesi

10. FTE (Full-time equivalent)

Presents the available workforce. Includes permanent, temporary and contigent workers who had been paid salary.

An example: If 10 people work half-time, the FTE is then five.

FTE

☐ Choose this indicator

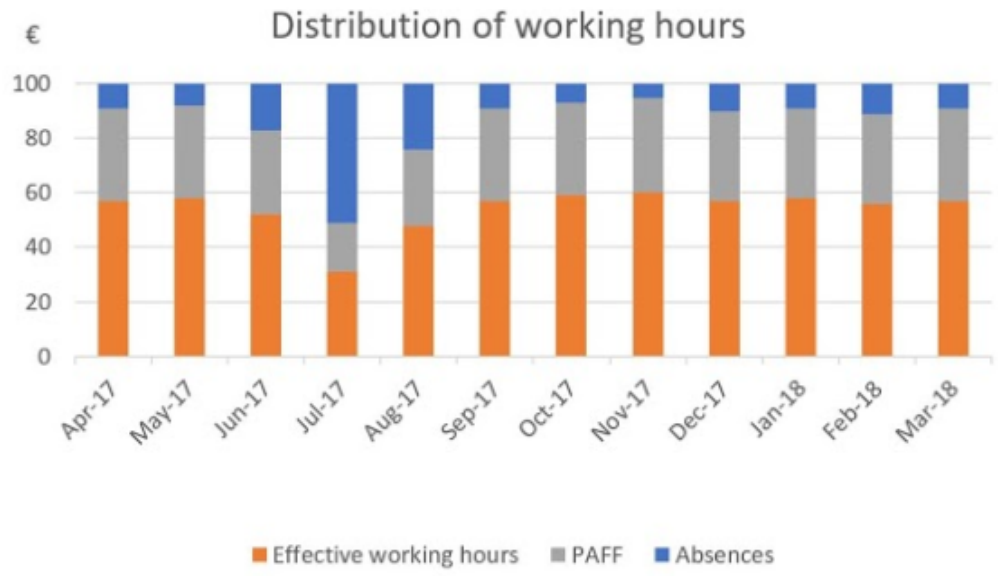
Oma vastauksesi

11. Effective working hours

Effective working hours = Quality of working life * Total working hours

Total working hours are not equivalent to the hours employees spent for actual work. Working time can be divided to absences, other working time (PAFF, refers to the time spent at work but not working) and effective working time.

This is calculated with the help of QWL (Quality of Working Life, based on the employee satisfaction survey)



Effective working hours

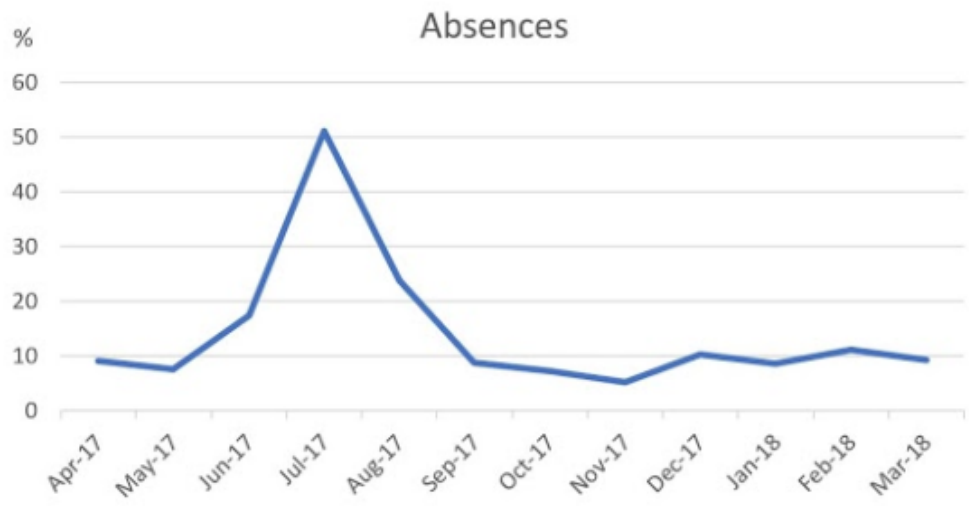
☐ Choose this indicator

Oma vastauksesi

12. Absenteeism

Absence % = (Absence hours / Theoretical working hours) * 100 %

Includes absences due to vacation, sickness, parental leave, training and accident



Absenteeism

☐ Choose this indicator

Oma vastauksesi

TAKAISIN LÄHETÄ